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« Mid-Term Review:
Scientific Support for Oceanic Fisheries Management in the western and central Pacific Ocean (SCIFISH), 2007 – 2010 »

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ACRONYMS USED IN THIS REPORT

Acronyms used in the report are defined in the table below, and in many cases are not actually defined at point of first usage in the text.

ACP	Africa, Caribbean, Pacific (States)
AusAID	Australian Agency for International Development
AWP	Annual Workplan and Budget
CBT	Competency-Based Training
CLS	Collecte Localisation Satellites
CMM	Conservation and Management Measure (of the WCPFC)
CRGA	Committee of Regional Governments and Administrations
DevFish	Development of Tuna Fisheries in the Pacific ACP Countries
DWFN	Distant Water Fishing Nation
EC	European Commission
EDF	European Development Fund
EEZ	Exclusive Economic Zone
EU	European Union
FA	Financing Agreement
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the United Nations
FFA	Forum Fisheries Agency
FFC	Forum Fisheries Committee
FSM	Federated States of Micronesia
GDP	Gross domestic product
GEF	Global Environment Fund
HoF	Head of Fisheries
ICT	Information and Communications Technology
IUU	Illegal, Unreported and Unregulated
IWP	International Waters Project
JICA	Japan International Cooperation Agency
JTF	Japan Trust Fund
M&E	Monitoring and Evaluation
MCS	Monitoring, Control and Surveillance (of fishing activities)
MDG	Millennium Development Goals
MHLC	Multilateral High-Level Conference
MRAG	Marine Resources Assessment Group
MTR	Mid Term Review
MTR	Mid-Term Review
NTSA	Niue Treaty Subsidiary Agreement
NZAID	New Zealand Aid
OCT	Overseas Countries and Territory
OFCF	Overseas Fisheries Cooperation Foundation (of Japan)
OFP	Oceanic Fisheries Programme (of the SPC)
OVI	Objectively Verifiable Indicator
P-ACP	Pacific ACP countries
PACREIP	Pacific Regional Economic Integration Programme
PFRP	Pelagic Fisheries Research Programme
PIC	Pacific Islands Country
PICs	Pacific Island Countries (here meaning P-ACPs plus Pacific OCTs)
PIFS	Pacific Islands Forum Secretariat
PIRFO	Pacific Islands Regional Fisheries Observer
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
PRIP	Pacific Regional Indicative Programme

PROCFish	Pacific ACP and French Pacific OCT Regional Oceanic and Coastal Fisheries Development Project
PSAT	Pop-up satellite archival tag
PSC	Project Steering Committee
PTTP	Pacific Tuna Tagging Programme
RAO	Regional Authorising Officer
SciCOFish	Scientific Support for the Management of Coastal and Oceanic Fisheries in the Pacific Islands Region Project
SciFish	Scientific Support for Oceanic Fisheries Management in the Western and Central Pacific Ocean Project
SEAPODYM	Spatial Environment and Population Dynamics Model
SMART	Specific, Measurable, Achievable, Relevant and Time bound
SPC	Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Programme
SPRTRMP	South Pacific Regional Tuna Research and Management Project
SSAP	Skipjack Survey and Assessment Programme
TA	Technical Assistance
TBAP	Tuna and Billfish Assessment Programme
TCP	Technical Cooperation Programmes
TDW	Tuna Data Workshop
ToR	Terms of Reference
TUFMAN	Tuna Fisheries Management Programme
UAV	Unmanned Aerial Vehicles
UN DOALOS	United Nations, Department of Ocean Affairs, Law of the Sea
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission (the 'Tuna Commission')
WCPO	Western and Central Pacific Ocean

Locally-based tuna long-liner, Noumea, New Caledonia

EXECUTIVE SUMMARY

The field mission was undertaken between 18 October and 18 November 2010 in Fiji, Solomon Islands, Vanuatu, New Caledonia and French Polynesia. A total of 79 persons from concerned stakeholder and beneficiary institutions were interviewed. The overall design of the project is appropriate for enhancing the provision of high quality, accurate and reliable scientific data and information on regional tuna fisheries for formulation of policy and management at both regional and national levels. The strategy that has been employed follows that successfully used in previous EU funded interventions.

The **Overall Objective** is fully consistent with the Fisheries Focal Sector stated in the 9th EDF PRIP. It has promoted regional cooperation between Pacific Island States in policy formulation, and coordinating effective policy delivery through the implementation appropriate management measures through the aegis of the Tuna Commission. The design of the Project also contributes directly to the attainment of MDG's no.1 (poverty alleviation, employment creation) and 7 (environmental sustainability, resource stewardship) by PIC's.

The **Project Purpose** responds directly to the Pacific Regional Indicative Programme (PRIP) para 144, which calls for the improvements in scientific information on oceanic marine resources and their ecosystem. The three results and activity focus has been well designed to enhance the effectiveness of the WCPFC, in line with PRIP para 145. The Project Purpose has also helped PICs to meet certain obligations to FAO in regard to realisation of the Code of Conduct (National and Regional Plans of Action (e.g. on IUU fishing, sharks, vessel overcapacity).

The **results** and their respective activities are specific, relevant and ultimately achievable, albeit in some cases not within the lifespan of SciFish. The three result areas logically flow one to the other.

The **logical framework** provides a sufficient indication of broad intent. However, the lack of SMART OVI's in the SciFish log-frame, and the poor quality of the descriptive text of the Annual Work Plan and Budget (AWPs) documents, as well as the 6-monthly and annual reports, presents difficulties for effective monitoring and evaluation of SciFish achievements.

SciFish's **assumptions** and pre-conditions have all proved to hold true and have had no negative impact on Project implementation. This is fortunate, given that no regular appraisal and reassessment of assumptions was undertaken.

Relevance

SciFish is a highly relevant Project, widely appreciated by senior PIC officials. However, the visibility of the project in terms of its name is not high. The ability of PIC nationals to make meaningful contributions to the many and varied sub-regional meetings of the SPC, FFA and WCPFC continues to develop. Experience, understanding and consequently confidence levels are rising. The 'ownership' by PIC national of such meetings, their outcomes and the processes by which they feed into conservation and management measures that level of the Commission is clearly apparent at the recent set of FFA meetings attended during the MTR.

Recommendations

1. The AWP should include a revised logical framework, with target SMART objectively verifiable indicators for results and target indicators for activities.
2. The PSC should thoroughly examine the validity of the logical framework and provide real feed-back during the annual PSC meeting.
3. The assumptions and preconditions given in the logical framework should be subject to regular appraisal and reassessment by the PSC, to ensure that such factors that impact on Project success are given adequate consideration in work plan formulation, and necessary amendments made.
4. To increase project visibility, SPC should consider developing specific information on SciFish on the SPC OFP website.

5. Given that a number of activities will be concluded between before the programmed end of the Project in mid-2011, it is recommended that a final evaluation of SciFish be undertaken as part of the SciCOFish Mid-Term Review (presumably mid-2012).
6. Dedicated support staff should be considered for funding support, whose role it would be to ensure that progress reports are comprehensive and adequately report on developments against the OVIs and targets.

Efficiency

SPC's OFP has been highly efficient in its role as Lead Agency for SciFish. The organisation and management of SciFish closely follows similar arrangements for previous EDF funded projects executed through OFP. OFP senior personnel have long experience of EDF/EU terms, conditions and procedures. This has resulted in efficient, even exemplary implementation. SciFish funding has created significant synergies with other complementary activities being implemented through the OFP's Strategic Plan.

FFA has been an effective technical partner organisation, responsible for control and surveillance activities (including high tech development such as VMS). However, implementation of FFA-driven activities under SciFish has been hampered by four changes of incumbent in the key post of FFA Director of Operations (the position is currently vacant).

Annual Workplan and Budget documents have not conformed to standard log-frame theory. For 2008 and 2009, they lacked SMART OVIs for Project results. No specific target reference points have been given for activities planned during the course of the year. The format and content of the AWP has not been consistent over the past three years. The budget has however been consistently well documented.

The format and substance of the 6-monthly and annual progress reports has also varied, with the financial aspects being the only consistently well documented aspect of the report. These shortcomings of the AWP have not, however, appeared to inconvenience the stakeholders and beneficiaries, or the efficiency of project implementation.

The Project Steering Committee (PSC) has, as a monitoring body, played a minimal role in ensuring the efficiency of implementation. The FA provides no specific Terms of Reference for the PSC, which may have diminished its effectiveness.

Financial management of SciFish has been undertaken by OFP as part of its core activity. SPC's long and successful track record in financial management of regional projects and programmes and EU rules and procedures has resulted in very efficient spend rates, within budget and in compliance with EU requirement. Financial reporting has been good. Necessary derogations have been applied for an approved in accordance with EC rules. Spend rates have been excellent: 99% committed and 77% spent overall.

Implementation of activities has been efficient and, in the case of OFP, most results have been achieved, or will be by the end of the Project. For MCS-related activities falling under FFA's responsibility, results have been partially achieved, primarily due to a lack of continuity in the key post of Director of Operations. Flexibility and the ability to respond to changing circumstances has been displayed, e.g. the extra effort placed on observer training order to meet the Commission's requirement for 100% observer coverage on purse-seiners. Recruitment of long-term technical assistance staff funded under the Project was achieved the first year, resulting in an efficient start-up phase. Recruitment followed the standard SPC staff recruitment practices and procedures.

The long experience in the Region and deep understanding of the fisheries sector of senior OFP managers has been a major contributory factor in the efficient management of the Project. The experience of the financial staff within the organisation of EU rules and procedures has resulted in very efficient spend rates, within budget and in compliance with EU requirements

Recommendations

1. Develop specific Terms of Reference for the Project Steering Committee (probably not useful for SciFish, but more for successor projects), to ensure effective on-going monitoring and evaluation as well as oversight of the direction of the project.
2. Increase visibility of project achievements by developing specific information on SciFish on the SPC OFP website.
3. Include dedicated administration support budget line into future projects.

Effectiveness

Progress reports provide inadequate levels of detail for the technical activities undertaken and results generated. Only the financial aspects of the Project are reported on in depth. The lack of well-defined OVIs and specific targets for the different activities set forth in the AWPs contributed to this situation. Reference to scientific papers within the reports without providing a summary of what such contain is not instructive.

Notable successes under Result 1: Enhanced Oceanic Fishery Monitoring include: (a) training of 456 observers, increasing the pool of national observers available for deployment under the WCPFC Regional Observer Programme from around 180 to over 600 during the course of the project; (b) Training of observer trainers, leading to the creation of a cadre of national teachers and further capacity building of national observer programmes; (c) Training attachments for fisheries officials for skills development in regard to data handling, database management, data analysis and statistical report writing; (d) provision of operational support for observer/port sampling programmes (personnel and recurrent costs), resulting in expanded existing national observer schemes and increased contribution to regional research initiatives; (e) Trials of grab and spill catch sampling methodologies to quantify the degree of bias inherent in grab sampling; (f) development of a Regional MCS Strategy; and (g) further development of the OFP Tuna Fisheries Management (TUFMAN) database system.

Recommendations

1. For each PIC (ACPs and OCTs) assess the level of support for continued data collection (human resources, operational costs) and identify appropriate measures for continued support (SciCOFish, WCPFC, donors). This could be conducted as part of the annual Tuna Data Workshop.
2. Include tag seeding training in recognised observer training courses.
3. Direct donor funding of national posts and running costs is contrary to the Paris Declaration and should gradually be phased out and these costs incorporated into national establishments. Future project design should consider the 'use-pays' principle and move towards cost recovery from the industry.
4. In the meantime, given the very real constraints facing New Caledonia and French Polynesia, fishery monitoring support should be extended into 2011 as far as funding allows, at least until June 2011.
5. National Sampling Coordinators and the National Observer Coordinators in New Caledonia and French Polynesia will not be supported after June 2011. The OCTs have opted not to be part of SciCOFish, and thus the OCTs should be encouraged to institutionalise these posts and their associated recurrent costs as soon as is practicable.
6. In the meantime, extend National Sampling Coordinators in New Caledonia and French Polynesia as far into 2011 as possible.
7. Increase cooperation with Indonesia and Philippines on fisheries monitoring, particularly in regard to catch and effort, due to the impact of those fisheries on yellowfin and bigeye.
8. To improve local sustainability for the initiatives supported by SciFish, the data collected from the various activities should be used locally for rapid reporting and decision-making by increased emphasis on developing local capacity for conducting analysis.
9. Develop a regional standard for spill sampling, for the guidance of on-board observers, and include in observer training curriculum.

Notable successes under Result 2: Enhanced stock assessments include: (a) highly successful large-scale tagging / biological studies on tropical tunas (skipjack, yellowfin and bigeye tuna), successfully

conducted across a wide area of the tropical western Pacific, as well as associated activities such as measures to aid return of recaptured tags. Over 260,000 tagged fish and a tag return rate of around 15% makes this the most successful tagging experiment in the world; (b) tagging and biological research on South Pacific albacore, which forms the basis of OCT domestic tuna fisheries; (c) incorporation of tagging data and/or analytical results into the MULTIFAN-CL stock assessment model and input of results to inform the decision making processes leading to elaboration of Conservation and Management Measures (CMMs) of the WCPFC.

Recommendations

1. Identify ways to fund the establishment of national and/or sub-regional Tag Return Officers in all unloading/processing points, especially in regard to transhipment and long-line.
2. Continue Tag Recovery Officer position within OFP for as long as possible into 2011. With considerable numbers of tags still being received, and important tag seeding work on-going, support for this position is critical and there is no equivalent position funded by SciCOFish. In the longer term (beyond 2011) SPC should locate other resources to support this position.

Notable successes under Result 3: Enhanced understanding of the pelagic ecosystem include: (a) further development of the SEAPODYM model: SEAPODYM code clean-up and documentation (100% completed); Development of supporting software to implement new standard formats for input and output files (90% completed); Revision of some aspects of the population dynamics of the model (100% completed); and Development of a version of SEAPODYM that can estimate parameters from fisheries data and the application of parameter estimation to various data sets (100% completed); (b) on-going work that is investigating: (i) the correlation between environmental factors and tuna recruitment for use in tropical tuna and albacore stock assessments; (ii) the impact of closing areas of ocean to fishing as a fisheries conservation measure; and (iii) the inter-relationship between variation in oceanographic variation on locally-based fishery performance in specific EEZs.

Recommendations

1. Extend Fisheries Oceanographer position as far into 2011 as possible.
2. Support targeted additional in-port biological sampling of albacore otoliths/gonads in French Polynesia and Cook Islands (where observer sampling has proved difficult), for micro-chemistry analysis.
3. Contract out laboratory analysis of gonads and otoliths (for specific things that OFP is not equipped to do).
4. Support further diet and muscle isotope analysis.
5. Support a tagging cruise of short duration (1-2 weeks) to deploy additional PSAT tags on albacore.
6. Publish national-level tagging reports on OFP website (password controlled).
7. Publish results of tagging cruises/data analysis in peer-reviewed journals to ensure international recognition and validity.
8. Ensure all scientific publications also translate to readily identified policy/management actions for consideration at Science Committee and Commission level.
9. Publish results of SEAPODYM model development in peer reviewed journals, to ensure international recognition and validity.
10. A non-technical summary of project outputs should be included in reports for wider distribution to fishery managers. Efforts should be focused on how to ensure that national fishery managers can best understand how to translate the scientific results into practical use for formulating policy and management options.

Activities and results in the context of the Project Purpose

SciFish has already certainly achieved its Project Purpose: the provision of a scientific basis for regional and national regional and national oceanic fisheries management. SciFish has clearly assisted in building competencies at national level. Monitoring of tuna fishing vessels has improved, data

collected is of higher quality and the tools to store, analyse and share it have been expanded and improved.

Result 1 has already yielded improved information that has been used effectively in the formulation of Commission CMMs. Data analyses and report generation that are currently on-going will further inform the process before the end of SciFish. Significant national capacity building has been achieved. Monitoring of tuna fishing vessels has improved, data collected is of higher quality and the tools to store, analyse and share it have been expanded and improved.

The tagging experiments undertaken under Result 2 have yielded valuable information and have significantly contributed to the understanding of the major tuna stocks in the region. SEAPODYM development has progressed significantly under Result 3, and this paves the way for practical application at both the national and regional levels for predicting likely future scenarios of fishery/environment interaction.

The numerous technical meetings held at FFA to formulate management options and positions prior to the conduct of annual meetings of the Tuna Commission and its sub-committees are instrumental in ensuring the engagement of PIC officials in interpretation of the results emanating from the science, and consequent input in the process leading to formulation of tuna management options. The meetings attended during this review of the FFC sub-committee on South Pacific Tuna and Billfish, the PNA Long-line Vessel Day Scheme Technical Working Group, and the FFA Management Options Consultation (preparation for the next session of the Tuna Commission) are some examples where OFP, FFA and PIC personnel freely explore the results emanating from the science and use it as the basis for identifying policy and management options.

Unforeseen beneficiaries and consequences

The main stakeholders and beneficiaries have been the WCPFC, and the Pacific ACP and OCT Governmental departments involved in tuna fisheries management at national level. The ACP and OCT states are now more able to effect their data reporting obligations to the Commission as a result of SciFish support. Other organisations have also benefited through capacity enhancement of staff involvement with SciFish, particularly FFA and the PNA group.

Incidental beneficiaries have included private sector actors involved in, for example, chartering arrangements for tuna tagging vessels and the associated economic activities (provisioning, wharf fees, etc.). The observer training activities have also assisted to some degree PNG to further enhance the potential for Kavieng Maritime College to develop as a competent regional centre for observer training at basic and higher levels.

Realisation of project assumptions

Project effectiveness has not been negatively impacted by the validity of the project assumptions, which have been met. Even the most potentially problematic assumption (ACP and OCT governments will commit to implementing fishery monitoring methods as recommended by the project) appears to be holding true.

Use of Project resources

It is evident from audit reports and interviews that all human, financial and material resources provided under SciFish (Technical Assistance and other personnel, equipment, training, research, etc.) have been procured in accordance with the agreed procedures, and fully employed in pursuit of Project activities and result.

Technical Assistance posts have been filled through open competition, in line with SCP standard procedures. They are without exception of high calibre and well able to achieve their respective tasks.

The high calibre of management provided by TA staff has been instrumental to the success to date of SciFish.

Impact

The impact of the monitoring and scientific research aspects of SciFish (OFP responsibilities) has been high. The impact of MCS activities (FFA responsibilities) has been low.

Improved fisheries monitoring has been the largest single impact, resulting in improved data and other forms of biological and operational information for the use of national administrations as well as feeding into the regional process to inform policy and management decision making.

Considerable human resource development has been achieved. Operational support (funding for staff and equipment) has had major beneficial impact on monitoring systems at national level throughout the region.

Many more PIC nationals are now available for deployment in the regional fisheries observer programme than was previously the case. The adoption of the PIRFO Standards provides a career structure (from cadet through to Observer Manager) which was lacking previously.

Further development of database systems (TUFMAN) will have a major lasting impact on the ability of national authorities to meet their reporting obligations to WCPFC.

Improvements made to stock assessments through data generation (tagging) and model development (MULTIFAN-CL) are set to have an impact on establishing scientifically-based CMMs for tuna resources. Writing up and publication of this work is continuing. Peer review and further consideration of results at Commission level is certain to increase the impact.

Regional coordination between the Commission, SPC, FFA and the national administrations has been further strengthened in support of controlling in-zone fishing and the wider regional control dimension.

The MCS strategy developed under the FFA component has had less immediate impact, but sets an appropriate framework for improved integrated MCS in the future.

The impact of national tuna management plans developed by FFA with OFP input is hard to judge at this stage. These plans form a useful framework for planning the sustainable development and management of national tuna resources, as well as meeting regional obligations for submission of tuna fishery data.

Donor coordination and support for monitoring, tagging and model development is good and likely to continue, given successes to date.

It is not possible to determine the extent to which SciFish alone has contributed to these impacts, but it certainly has had a positive synergistic effect.

There have been no negative impacts.

Sustainability

SciFish will not be extended *per se*. Many of its activities are included in the design of the SciCOFish Project. As noted in section 3.4 of the Financing Agreement, the OFP is itself the main mechanism that will provide continuous follow-up of project results beyond SciFish, and will be in a position to follow up on and realize the value of SciFish results. Follow-up on the results of SciFish are already being pursued through SciCOFish, which has been designed to complement and continue many of the activities supported under SciFish.

The EU is a major consumer of the tuna products exported from the region. EU flag vessels are already enjoying the benefit of fishing in the region. It is therefore in the EU's interests to continue to support regional programmes that aim to ensure the long-term sustainability of the fisheries. The EU should therefore continue to support programmes that strengthen national and regional cooperative efforts to improve monitoring of fishing as the basis of good planning, policy and management.

The relationships between national administrations and regional agencies have been strengthened, and prospects are good for sustained regional coordination and cooperation at all levels. It should be noted though that there is considerable discrepancy between the PICs in terms of their economic ability to sustain the quality of their national monitoring systems. For states where fisheries management is well supported (e.g. PNG) continued support for monitoring, tagging, modelling and associated activities,

in support of PNA and the wider Commission mandate can be expected. For some other states, institutionalising the costs of staff and their running costs will be more problematic. This is particularly the case for OCTs, which face problems in absorbing the currently SPC-contracted staff and their associated operational costs into their establishments.

Donor commitment to the Paris Declaration (including the EU) requires the phasing out of donor support for 'parallel structures' within national administrations, including project-funded national observers, de-briefers etc., in preference to building more on institutionalised staff, systems and procedures to effect project delivery.

Recommendations

1. Although most of the Project's activities will continue under SciFish, the PICs ultimately need to ensure institutionalisation key positions such as on-board observers and observer de-briefers. PICs need to make provision for adequate human, financial and material resources by PICs in national establishments and recurrent budgets for long-term sustainability of the monitoring programmes.
2. In the longer term, such costs need to be passed on to the resource users (fishing industry) and the 'user-pays' principle applied.

1 INTRODUCTION

1.1 SCIFISH PROJECT SUMMARY FEATURES

The Scientific Support for Oceanic Fisheries Management in the Western and Central Pacific Ocean Project (SciFish) aims to provide the scientific basis for offshore fisheries policy and management decision making at national and regional level. It directly serves the mandates and aims of the Western and Central Pacific Fisheries Commission, as well as the 14 Pacific ACP states (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu) and French OCTs (New Caledonia and French Polynesia).

SciFish is a four year project which commenced in March 2008, funded under the 9th EDF. Funding arrangements for the ACP and OCT states are subject to separate Contributing Agreements, although all project activities are to a large extent integrated and complementary.

SciFish is designed to achieve three main results: (a) Enhanced oceanic fisheries monitoring, with activities focused on observer and port sampling training and support but including an MCS component that is to be implemented by FFA and New Caledonian Service de la Pêche; (b) Enhanced stock assessment of key tuna species (skipjack, yellowfin, bigeye and albacore), with activities focused on tuna tagging and biological research; and (c) Enhanced understanding of the pelagic ecosystem and fishery interactions, with activities focused on developing ecosystem models as tools for determining the impacts of environmental variations, including climate change, on oceanic tuna fisheries.

The Financing Agreement was signed by the EU Commission on 24 Oct 2007. The Pacific Islands Forum Secretariat (PIFS) signed on 19 Nov 2007 (on behalf of the ACP States) and the Government of New Caledonia on 17 Dec 2007 (on behalf of the OCT States: French Polynesia, New Caledonia and Wallis and Futuna). SPC, as implementing agency, commenced draw-down of funds early in 2008. Summary information taken from the Financing Agreement is given in Figure 2 below.

Figure 1: Main features of SciFish

Project Name: Scientific Support for Oceanic Fisheries Management in the western and central Pacific Ocean (SCIFISH)

Identification Number: RPA/001/06rev.

Accounting Number: 9 ACP RPA 13 & 9 PTO REG 8.

Financing Agreement Number: 9276/REG.

Implementing agency: Secretariat of the Pacific Community.

Location: Regional with Project Staff based in Noumea, New Caledonia and Honiara, Solomon Is.

Duration: 48 months (2008-2011).

Value: total: €6,610,000 (ACP €4,000,000, OCT €2,610,000).

Participating countries: The 14 Pacific ACP countries: Cook Islands, Fiji, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Papua New Guinea, Palau, Solomon Islands, Samoa, Tonga, Tuvalu, and Vanuatu and French OCTs: New Caledonia and French Polynesia.

Key Stakeholders: Pacific Islanders involved in management and development of tuna resources within the region.

Project Purpose: Improved policy and scientific information for better management of the regional and national oceanic fisheries.

EU Monitoring missions: One project Results Orientated Monitoring mission was undertaken in August 2010.

Source: Project documents.

The Financing Agreement is supplemented by two Contribution Agreements: one signed between SPC and PIFS, Suva, Fiji (as RAO for the ACP states), and one between SPC and the Government of New Caledonia (as RAO for the participating OCT states). These Contribution Agreements lay out matters concerning the Special Conditions relating to the purpose of the project, entry into force, implementation period, the finance available and financing arrangements (for the specific country groups), as well as reporting requirements (both technical and financial). The annexes provide a detailed description of the intervention, EC general conditions applicable to funding provided to international organizations, a details budget breakdown, standard financial forms and payment request formats.

1.2 EVALUATION ACTIVITIES

The Mid-Term Review was funded under EUROPEAID/119860/C/SV/multi LOT N° 6: Environment, Request N°: 2010 /247943. SAFEGE (Brussels) was subsequently awarded an EDF Service Contract to carry out the Mid-Term Review, with a total of 36 working days over the period 1 October 2010 and 31 January 2011. The Mid Term Review was undertaken by contracted Tuna Fisheries Expert, Mr Paul Nichols[1]. The Terms of Reference for the Mid Term Review are given in Annex 1.

The work schedule followed is given in Annex 2. Field work commenced on 18 October 2010. An initial briefing to clarify the ToR, and agree logistical and practical issues was held on 21 October with representatives of the EC Delegation in Fiji and the Forum Secretariat (Regional Authorising Officer for the Pacific-ACP States).

Given the fact that many key P-ACP officials with involvement in SciFish were attending a number of meetings at the South Pacific Forum Fisheries Agency in Honiara, Solomon Islands, during the period 25 Oct – 4 November, arrangements were made for the Consultant to discuss SciFish in the margins of those meetings. The Consultant visited Vanuatu and held discussions with fisheries department staff, and also Noumea, New Caledonia, for discussions with staff of the OFP of the Secretariat of the Pacific Community (SPC) and with the Government of New Caledonia (as RAO for the participating OCTs). The Consultant also visited stakeholders in Papeete, French Polynesia. A final wrap-up meeting was held in the EU Delegation in Suva, Fiji on 16th November 2010.

A total of 79 persons from concerned stakeholder and beneficiary institutions were interviewed in regard to their perceptions of SciFish. Names, designation and e-contacts are given in Annex 3.

Project documentation was kindly provided by the EC Delegation, Fiji and the OFP (Annex 4). Additional material was obtained from the websites of the OFP, WCPFC and FFA.

1.3 EVALUATION METHODS

The approach to evaluation is outlined in the Terms of Reference (Annex 1), which also set out specific evaluation questions. Guidance on the interpretation of evaluation criteria was drawn from the EU Guide on Ex-post and Intermediate Evaluations[2].

2 SCIFISH PROJECT DESIGN

The design of the Project is intended to provide high quality, accurate and reliable scientific data and information to support the development of regional polices and management at the level of the WCPFC as well as at national level, to facilitate the long-term conservation and management of tuna resources, which together represent probably the most value and significant renewable resource available to the Governments and peoples of the western-central Pacific region.

[1] E-mail: pvnichols@gmail.com

[2] Evaluating EU Expenditure Programmes: A Guide to Ex-Post and Intermediate Evaluation Budgetary Overview and Evaluation Directorate-General XIX – Budgets. European Commission. First Edition, January 1997.

The design is based on the delivery of three, well defined, mutually supporting results. These focus on improved fisheries monitoring and scientific research, enhancing knowledge of the stock status of the four major commercial tuna species (skipjack, yellowfin, bigeye and albacore) and further development of models to understand the pelagic ecosystem and wider ecosystem-fishery interactions. The design of SciFish builds upon previous and complements on-going interventions, funded by the EU and other donors.

As such, the Project integrates and supports many of the OFPs key responsibilities, and supplements to varying degrees funding from a variety of sources. The Project is designed with a 4 year time span (2008-2011).

2.1 OVERALL OBJECTIVE

The overall objective of the project is: *the conservation and sustainable use of oceanic fish resources of the western and central Pacific Ocean*.

The overall objective is highly relevant, and in fact is becoming even more relevant as time passes. The tuna stocks of the region currently supply around 60% of world tuna supplies. Compared with other regions, the stocks are relatively healthy (with the possible exception of bigeye) and have sustained highly profitable industrial fisheries (that employ mainly purse-seine, long-line and troll techniques) for many decades. The stocks also provide the daily subsistence needs of many Pacific Island peoples and therefore play an essential part in terms of national food security.

SciFish has been well designed to further support efforts to ensure that conservation and management measures are based on best available scientific advice, for the long term sustainability of the oceanic tuna fisheries. In a world where around 70% of global fish stocks are being fished either at or beyond sustainable levels, this project's overall objective for the tuna resources of the WCPO is highly commendable.

The Overall Objective is fully consistent with the Fisheries Focal Sector stated in the 9th EDF PRIP, in that it promotes regional cooperation between Pacific Island States in policy formulation, and coordinating effective policy delivery through the implementation appropriate management measures through the aegis of the Tuna Commission. The project enshrines many of the actions called for by the Leaders of the Pacific Islands Forum in the 2007 Vava'u Declaration on Pacific Fisheries Resources, which recognises regional fisheries resources as a key driver for sustainable economic growth in the region, especially for small island states, and that these must as a consequence be supported by responsible and effective stewardship.

The Project has clear implications not only for food security, but also social and economic benefits through direct and indirect employment and increased investment. The project has direct relevance to the efforts of Governments in the region to achievement of the Millennium Development Goals, particularly in regard to MDG number 1 (poverty alleviation, employment creation) and 7 (environmental sustainability, resource stewardship).

2.2 PROJECT PURPOSE

The project purpose is: *to provide a scientific basis for regional and national oceanic fisheries management decision-making by the Western and Central Pacific Fisheries Commission and by Pacific ACP and OCT Governments*.

The Project Purpose responds directly to the Pacific Regional Indicative Programme (PRIP) para 144, which calls for the improvements in scientific information on oceanic marine resources and their ecosystem. The focus on contributing to the effectiveness of the WCPFC is clear and well founded.

The three results and activity focus has been well designed to enhance the effectiveness of the WCPFC, in line with PRIP para 145. The Project has clearly assisted Pacific ACPs and OCTs to meet their obligations to the Commission in the collection, analysis and submission of relevant data and information related to their tuna fisheries within the time scales laid down by the Commission. The

resulting capacity that has been developed will help assure that these obligations of the PIC member states to the Commission continue to be met.

As members of FAO, all participating states have certain obligations to comply with the Code of Conduct for Responsible Fisheries. The project has achieved much to develop the skills of national fisheries officials in the construction of national plans of action to address issues including IUU fishing, vessel overcapacity, reduction of by-catch, protection of sharks, and provision of reliable data on fishing activities.

The Tuna Commission sets a formal 3 year service agreement with work plans with the OFP. Approximately $1 m per year is paid for stock assessment work and data management. The work plans are signed off by the Commission each year in the December meeting.

The OFP provides the major scientific input to the work of the Tuna Commission's Scientific Committee, which meets annually in August. Its role is to ensure that the Commission has the best available scientific information on which to consider appropriate conservation and management measures. The Scientific Committee utilizes the services of expert fisheries scientists of OFP and others. Its meetings usually comprise scientific and other related technical representatives. The SC also coordinates with the Technical and Compliance Committee on certain matters to ensure consistent advice is provided to the Commission.

2.3 RESULTS AND ACTIVITIES

The Project aims to achieve three main results. These and the corresponding activities are stipulated in the logical framework and summarized in Figure 2 below:

Figure 2: SciFish Results and associated Activities

Result 1: Enhanced oceanic fishery monitoring in Pacific ACPs, and OCTs and in the Commission Convention Area generally.

- Activity 1.1 Provision of training programmes for scientific observers and port samplers in Pacific ACPs through regional, sub-regional and national workshops.
- Activity 1.2 Provision of training attachments of national fishery monitoring staff at SPC headquarters.
- Activity 1.3 Provision of operational support (e.g. the provision of equipment, data forms, funding of observer trips and port sampling operations) for national scientific observer and port sampling programmes.
- Activity 1.4 Provision of quality control for scientific observer and port sampling data through data audits, operational reviews of sampling activities, observer debriefing and generally enhancing national capacity in observer and port sampling programmes.
- Activity 1.5 Development and trial of new technologies for enhancing quality of data and timeliness of data collection.
- Activity 1.6 Development of harmonised fisheries monitoring systems and data sharing protocols;
- Activity 1.7 Conduct of compliance audits and IUU risk assessments of ACPs.
- Activity 1.8 Develop and implementation of methodologies to verify fisheries data.
- Activity 1.9 Develop and trial new technologies, including satellite based technologies for the detection of IUU fishing activities.

Result 2: Enhanced assessments of the status of oceanic fish stocks and the impacts of fishing upon them.

- Activity 2.1: The conduct of large-scale conventional and electronic tagging and associated biological studies of tunas in the WCPO, including both tropical tunas (skipjack, yellowfin and bigeye tuna) and South Pacific albacore.
- Activity 2.2: The conduct of analyses of tagging, biological and fishery oceanographic data to obtain a better understanding of the population dynamics, behaviour and biology of oceanic fish stocks.

- Incorporation of tagging and biological data and/or the results of supporting analyses into models used to assess the status of targeted oceanic fish stocks and the impacts of fishing.

Result 3: Enhanced understanding of the pelagic ecosystem that supports oceanic fish stocks, including the ecosystem impacts of fishing.

- Activity 3.1: Develop and enhance models of the pelagic ecosystem supporting oceanic fish stocks targeted by regional tuna fisheries.
- Activity 3.2: Use such models to provide scientific advice on ecosystem aspects of fishery management, including (i) the impacts of environmental variability on oceanic fish stocks and fisheries; (ii) the effects of fishing on the pelagic ecosystem; and (iii) the potential benefits and effectiveness of specific ecosystem management measures, such as marine protected areas

The results and their respective activities are specific, relevant and ultimately achievable, albeit in some cases not within the lifespan of the Project. The design is logical in that Result 1 activities aim to produce a solid basis for participating states to enhance their capacity to collect, appraise, store, analyse and disseminate fishery-related data.

Such information, together with the tag-related information generated as a result of Result 2, will provide the sound scientific basis for stock assessment of the target key tuna species.

The national fisheries data plus tagging data together also flow into the high level modelling exercises being undertaken in Result 3, to improve the accuracy and reliability of the SEAPODYM model for region-wide and EEZ-specific assessments of fishery-environment interactions. This work has far reaching potential benefits for the region, especially in regard to predictive modelling of the impact of climate change on tuna distribution and abundance.

2.4 THE LOGICAL FRAMEWORK

The logical framework, as presented in the signed Financing Agreement, is given in Annex 5. The Logical framework clearly sets out the Overall Objective, Project Purpose, Results intended to achieve the three Project Purpose and the major activity areas intended to achieve the Results. These are clear and unambiguous. However, the Objectively Verifiable Indicators (OVIs) specified in the log-frame are not 'SMART' (i.e. specific, measurable, achievable, relevant, and time bound). The OVIs are vague and do allow effective monitoring of annual achievements against stated indicators. The performance indicators adopted should be dependent on, and related specifically to, the overall objective, project purpose and results agreed to in the FA. Ideally, the indicators should provide a simple, reliable and measurable basis for monitoring progress between regionally agreed baselines and targets.

Performance indicators may be adopted at various levels (e.g. goals, objectives, outcomes) and are typically used according to the following process:

- Establishing a baseline level for each indictor at the commencement of the intervention/time period;
- Establishing a target for each indicator relating to project objective, purpose and results, and
- Reporting against the indicators, to be included in the 6 and 12 monthly progress reports presented to the PSC and EU.

The log-frame is deficient on each of these levels. The OVIs given in the Annual Work Plan and Budget documents should ideally indicate, for the particular year in question, a baseline and a target indicator for each of the results and activities envisaged for that particular year. This then makes the report produced for the PSC and the donor partners more meaningful, since this would allow progress towards reaching the stated target indicators easer to see in the 6 and 12 monthly reports.

No baseline analysis was apparently conducted prior to formulation of SciFish. However SPC, as implementing agency, was not asked to provide or obtain such information, which was presumably not considered necessary for the design of the Project.

Unfortunately, the lack of SMART indicators in the FA, and the absence of baselines and targets in the AWP has resulted in the task of measuring real progress difficult. It is normal for the EU to require a logical framework to accompany all AWP's. This allows necessary revisions to the original log-frame to be proposed for the consideration of PSC and donor, so that effective internal monitoring and evaluation of progress towards achieving stated targets, objective and purpose can be made, and facilitates agreements on necessary changes in emphasis and direction. A well-constructed logical framework with SMART indicators would also assist external evaluation (mid-term and final reviews).

The final form of the logical framework, attached as annex 4 to the signed Financing Agreement, specifies seven activity areas (activity areas 1.2 and 1.3 in Figure 2 above do not appear). However, the descriptive text of the Financing Agreement lists all nine activities listed under Result 1. The log-frame (attached to this report as Annex 5) specifies the first activity area as being: 1.1 Training programmes for scientific observers and port samplers. Clearly the decision was made to expand this into three distinct areas (activities 1.1-1.3 in Figure 2 above), given the importance attached to this type of training under the Project. This has not proven problematic and indeed the expansion of observer/port sampling activities listed under the agreed log-frame into three activity areas (staff attachments and provision of operational support) is fully warranted, given the importance of such activities towards achievement of the Project Purpose.

However, variations in the agreed logical framework as attached to the Financing Agreement should have been noted and discussed by the PSC, given the likely impact such changes have made to AWP delivery and budgeting.

2.5 ASSUMPTIONS AND PRECONDITIONS

2.5.1 Assumptions

The logical framework lists the following assumptions:

For the overall objective: *World demand for tuna and related products of the Central and Western Pacific maintained at high levels*. Demand for tuna is high and almost certain to increase.

For the Project Purpose: *The tuna fishery remains a priority area for management and conservation by regional and national administrations*: this certainly holds true throughout the region, and is certain to continue to be the case. There is strong evidence to suggest that Pacific ACP and OCT Governments and the WCPFC are using the information and advice produced by the project in the decision making process leading to improved policy and management at national and regional level. All recent CMMs approved by the Commission were reported to have come about largely as a result of the advice provided through the Commission's Science Committee.

The importance of adequate monitoring and data analysis, through the development and use of computerized tools such as TUFMAN, has had a direct impact on national governments to ensure adequate human, financial and material resources are allocated to their national fisheries administrations in order to facilitate fisheries monitoring, data analysis and data sharing, with other states as well as with FFA and SPC.

Activities under the Project have clearly assisted in improving the availability of reliable, scientifically-robust data, in order to inform the decision making process at both regional and national levels. As world markets increase their interest in sourcing fish from the region, it is likely, based on experience to date, that the member states of the WCPFC, particularly the PNA members (due to the very high concentration of skipjack, yellowfin and bigeye tuna resources in their EEZs), will continue to require and fully utilise the types of data currently being generated in their deliberations with DWFNs, in pursuit of greater economic and social benefits from the fisheries active in the region.

For results 1, 2 and 3 (collectively):

Appropriate and compatible technologies available to strengthen existing monitoring, control and surveillance infrastructure: the information and communications infrastructure available to regional

fisheries administrations and organisations varies from country to country, but continues to improve. FFA, in particular, has done much to facilitate the development of information and communications infrastructure which have been instrumental to the success of the monitoring activities under the Project, including sharing of data and the development of high tech MCS tools such as VMS. Slow internet access and computer viruses continue to present problems for some states, which in turn has impacted on their ability to contribute to, and benefit from, Project involvement. Fisheries monitoring equipment (measuring boards, sample bottles, wet weather gear, etc.) is readily available through commercial suppliers.

Sufficient number of observers available for observer and port sampling missions: this assumption could well have become a killer assumption, especially in the face of the unexpected CMM/2008/01 agreed by the Commission, requiring 100% observer coverage on all purse seiners operating in the high seas areas of the Region. OFP staff recruited under the Project to undertake the observer training were able to respond very quickly and succeeded in recruiting and training a sufficient body of national observers, at least to cadet level, who were subsequently able to undertake regional observer duties.

Commitment by governments to seriously address IUU fishing: the threat posed by IUU fishing vessels is high on the political agenda in the Region, as it is worldwide. The entry into force on 1 Jan 2010 of new EU legislation[3] to reduce and eliminate the entry of IUU caught marine fish into the EU market has stimulated national fisheries administrations worldwide to examine and improve their national capacity for effective MCS. SciFish has assisted in these endeavours, primarily through the training of national observers and port-side enumerators, who form an essential element against the scourge of IUU fishing.

ACP and OCT governments will commit to implementing fishery monitoring methods as recommended by the project: this assumption appears to also be holding true, given the significant improvement in the coverage and quality of data collected, analysed and dispersed to date by national fisheries administrations. However, as discussed elsewhere, the OCTs in particular are facing problems in guaranteeing continued support for their national observer programmes (staff salaries and recurrent costs) after SciFish concludes.

Availability of vessel to be chartered for tuna tagging exercise: Tagging activities under the Project have been sustained and faced no significant problems such as vessel availability, breakdowns, or lack of live baitfish, other than forces beyond control (bad weather, scarcity of schools to tag).

2.5.2 Pre-conditions

A number of 'Assumptions' are listed against Project activities in the log-frame. However, these are actually preconditions, and include:

- *Availability of technical expertise for long and short term engagement*: No problems were encountered regarding the availability of technical expertise. All TA positions under the Project were successfully filled with high calibre, highly competent professionals.
- *New technologies for surveillance and data management affordable*: budgetary constraints were not reported for the technology required for MCS and data storage/ analysis/ transmission. However, electronic tags used under Result 2 were very expensive (around $5,000 each), resulting in necessary judicial use in tagging experiments.
- *Commitment from the countries to trial new technologies*: participating countries have been were supportive and willing to embrace and support the application new technologies such as VMS, electronic tags, new database designs, etc.
- *Status of tuna stocks at good levels to undertake scientific work covering targeted species*. The availability of albacore, caught in suitably good condition for tagging, presented a considerable challenge, as was the low availability of juvenile bigeye for tagging.

[3] EU Council Regulation (EC) No 1005/2008, (establishing a new European Community system to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing, of 29 September 2008, and subsequent implementing Regulations.

2.6 RELEVANCE

SciFish addresses key national and regional priorities for tuna fisheries in the Region and consequently the participating PICs indicated strong and sustained support for the Project. SciFish represents an important component of the OFP Strategic Work Plan, and has been discussed by at least two HoF meetings, as well as the CRGA (SPC's governing body). Stakeholder interviews unanimously confirmed that the Project Purpose, results and activity areas indicated in the logical framework were highly relevant to informing the processes leading to regional policy and management strategies for the tuna resources. Support was given for the necessary regional approach, but many stressed a need for advice to be available for planning and management at the national level.

The Project Steering Committee has met three times (May 2008, February 2009 and May 2010) to discuss progress made and the subsequent year's annual work plan and budget. Consultations with PIC officials revealed a very high level of appreciation for the work that SciFish has supported, although some people were not familiar with the Project's acronym. It is apparent that the Project has not had high visibility. The lack of an agreed project emblem may be a contributing factor. Enhancing visibility of the Project with the EU as the donor is not a key issue in the Financing Agreement. In addition, due to the manner in which SPC has used SciFish funds to support project activities, whereby activities have in the main been co-funded with one or more other sources of funding including SPC core funding, it has not been appropriate to 'raise the flag' over particular activities as being 'SciFish'. PIC officials indicated that unless they are informed that a particular activity is funded by a particular donor, they would not know the origin of the support.

The strategy employed is broadly similar to that followed in previous interventions, and builds on earlier successful work delivered.

The strategy under Result 1 to enhance national capacity for monitoring of fisheries activities, and in so doing to strengthen the ability of national governments to meet their data submission obligations to the Tuna Commission is highly relevant.

Result 2 is also highly relevant in that it builds on the long experience of SPC in the use of tuna tagging experiments in order to inform the stock assessment models that have been under development for many years.

The focus of the pelagic ecosystem modelling of Result 3, particularly in regard to building in the ability to model likely impacts of global climate change in the tuna fisheries within the region and how this can inform both policy and management at the government level, as well as investment strategies for tuna processors, has very real and long term beneficial implications for participating states.

Despite improved monitoring of tuna fisheries by PICs, the assessment of tuna stocks is known to be highly influenced by the catches taken by non-ACP/OCT member states, notably Indonesia and Philippines, where the impact of fishing mortality, particularly for bigeye, is not known precisely. The Project has made a direct contribution to the Commission's attempts to engage these countries into meaningful collaboration, to research the likely impacts of these fisheries on the status of the tuna stocks under the Commission's mandate, and ultimately in management measures for them.

2.7 RELATED INTERVENTIONS

The OFP is the regional focal point for tuna fisheries science and data acquisition, and the primary technical implementing agency for SciFish. The OFP can trace its origins back to the establishment of the **Skipjack Survey and Assessment Programme (SSAP)** in SPC in 1977, whose main role it was to provide advice to SPC member states on skipjack pole-and-line fishery and associated baitfish resources of the SPC region, and to support the development and management of these fisheries (which dominated at that time). SSAP undertook pioneering large-scale tagging experiments which revealed the exploitation potential of the skipjack tuna resources of the region.

The Tuna and Billfish Assessment Programme (TBAP) was established in 1982 as a follow-up programme to the SSAP, and in response to the growing need to document tuna catch and effort and

to understand tuna population dynamics and the interaction among the fisheries. TBAP established the **Regional Tuna Fisheries Database** and implemented a second successful large-scale tagging experiment, the **Regional Tuna Tagging Project (RTTP)**, funded under the 6th EDF. The RTTP focused on the three principal tropical tuna species: skipjack, yellowfin and bigeye tuna, and also implemented an albacore tagging project with complementary French OCT funding. The RTTP provided updated information on the exploitation status of skipjack tuna, and the first tag-based information on the exploitation, growth, mortality and movements of yellowfin, bigeye and South Pacific albacore tuna. The results of these tagging experiments continue to make an important and direct contribution to routine stock assessments for the four species.

In 1995, the TBAP was renamed the **Oceanic Fisheries Programme (OFP)**, to reflect the need for SPC members to collect information on the pelagic ecosystem in general. The OFP implemented the 7th EDF-funded South Pacific Regional Tuna Resource Assessment and Monitoring Project (**SPRTRAMP**), which was designed to establish continuous and comprehensive scientific monitoring of the region's tuna fisheries, to undertake studies of the biology and ecology of the main exploited species, and to develop and enhance methods for providing scientific advice on the status of stocks and the impacts of fishing. The tuna tagging activities under SciFish (which is the main focus of Result number 2) evolved from RTTP (6th EDF), and SPRTRAMP (7th EDF).

OFP oceanographic research has received support from the **Pelagic Fisheries Research Programme** (**PFRP**), in association with the University of Hawaii. PFRP is taking the "SEAPODYM" and "SKIP I" models (developed with EU support under PROCFish – Oceanic component) and combining them on a single "stretched" grid. The "stretched grid" allows the spatial resolution to vary so that increased accuracy can focus on the areas of the ocean of greatest interest, such as the main fishing grounds. PFRP forms part of a larger International Geosphere-Biosphere Programme and "Oceanic Fisheries and Climate Change Project" (OFCCP GLOBEC), which aims to predict the effect of short and long term climate changes on productivity and distribution of the oceanic tuna stocks and fisheries. The aim here is to develop a realistic simulation model that can be used to test outcomes under various global warming scenarios. The support provided under SciFish has allowed considerable progress towards SEAPODYM achieving this aim.

A summary of recently concluded, on-going and planned EDF-funded projects, are listed below:

The **Pacific ACP and French Pacific OCT Regional Oceanic and Coastal Fisheries Development Project** (**PROCFish – 8th EDF**): 2002-2007. An oceanic component (**PROCFISH-OCEANIC**)**: €3.9 m (ACP countries), and €1.0 m (OCTs)**, provided scientific support to P-ACPs, P-OCTs and the fledgling WCPFC for the sustainable management of the region's oceanic fisheries resources. A coastal fisheries component (**PROCFISH-COASTAL/ COFISH**): €7.6 m between 2001-2009, produced rigorous, comparable information on the status and prospects of reef fisheries, provided for the process of developing reef fishery management measures.

DEVFISH Project: **DEVFISH: €3 m – 2005-2009 (EDF9):** provided support for the development of domestic tuna industries and targeted the improvement and co-ordination of poverty eradication-oriented national fisheries sector policies. DEVFISH complemented PROCFISH, in fulfilling the vision of the Regional Strategy Paper and the RIP for P-ACP/EC cooperation in fisheries. DEVFISH sought to broaden cooperation between the P-ACP countries and the EC in fisheries generally.

Programme for Strengthening Fisheries Management in ACP countries (**ACP Fish II**): **€30 m of which €1.4 m reserved for Pacific activities – 2009-2014.** This EU-funded intervention supports the development of fisheries policy, and fostering improved institutional capacity for fisheries and aquatic resources management in all ACP countries.

SCIFISH - €4 m (ACP), €2.6 m (OCT) - 2008-2011 (EDF9): aims to provide a scientific basis for regional and national oceanic fisheries management decision-making by the WCPFC and by Pacific ACP and OCT Governments.

SCICOFISH - €9 m – 2010-14 (EDF10): Aims to provide a reliable and improved scientific basis for management and decision making in oceanic and coastal fisheries. Many aspects are extensions of SciFish.

DEVFISH 2 - €8.2 m 4 years (Proposed under EDF10): will focus on the development of sustainable domestic tuna industries.

Annex 6 presents a matrix of the accomplishments, gaps, identified needs and activities required to address such needs for interventions funded under EDF8, EDF 9 and EDF10.

The methodologies developed by the early tagging interventions as well as ProcFish and DevFish in regard to development of ecosystem models, monitoring and control of fisheries, and tuna tagging have been successfully incorporated into the design of SciFish.

There has been a general level increase in national capacity. Expertise has been developed in the PICs for better managing their respective fisheries sectors. SciFish is one of several interventions that has contributed to this favourable result, but is one that has generated significant synergy, particularly in the OCTs, in regard to per capita support provided to the OCTs through the Project.

The ability of PIC nationals to make meaningful contributions to the many and varied sub-regional meetings of the SPC, FFA and WCPFC has improved and is improving. Experience, understanding and consequently confidence levels are rising. The 'ownership' by PIC national of such meetings, their outcomes and the processes by which they feed into conservation and management measures that level of the Commission was clearly apparent in the various FFA meetings attended during the MTR.

The observer and port sampling aspects (training, operational support) stand out as very successful activities. This has led to a highly significant improvement of national fisheries observer schemes, and in turn to national capacity development for the collection and analysis of fishery data necessary for effective fisheries management at the national level, as well as flowing naturally into regional databases and thus region-wide decision making for management options.

Support provided to national observer programmes has had a direct impact on employment creation, through the creation of direct jobs for observers as well as service providers for the equipment and logistical support required for maintenance of the national and regional observer programmes. The close working relationships that have developed between SPC scientists and technical staff through training, attachments, data collection and analysis and subsequent working up of the results of such work into technical documentation and scientific publications has had clear and sustainable benefits for the PIC nationals concerned.

3 EFFICIENCY

3.1 ORGANISATION AND MANAGEMENT

The Secretary General of the Pacific Islands Forum Secretariat (PIFS), as Regional Authorising Officer of the European Development Fund, is the nominated Contracting Authority for the Project.

Implementation has been effected through two decentralised Contribution Agreements. The ACP Contribution Agreement is signed between PIFS (as Regional Authorising Officer) and SPC Secretary General of SPC. The OCT Contribution Agreement is signed between the President of the Government of New Caledonia (as Regional Authorising Officer) and the SPC Secretary General.

Both Agreements Decentralised Contribution Agreements were endorsed by the European Commission.

SPC has successfully implemented other EDF Contribution Agreements (e.g. 9.ACP.RPA.004 / 8.ACP.RPA.004). SciFish therefore qualifies as a contribution to SPC's efforts to jointly implement key elements of the Oceanic Fisheries Programme's Strategic Plan, with funding provided through the SPC core budget and other donors.

As per Council Regulation (EC) No 2112/2005 of 21 November 2005 on access to Community external assistance, eligibility is extended to individuals and legal persons, as well as supplies and materials which are eligible according to the rules of the international organisation implementing the action.

SPC has been effective in its role of Lead Agency overall. The SPC Director General, as Project Supervisor, signs of on AWPs, derogation submissions, and the progress reports. Actual day-today management has been the role of the OFP Manager and Chief Scientist (Dr John Hampton) as Project Coordinator. His long experience in the Region and deep understanding of the fisheries sector has been a major contributory factor in the efficient management of the Project.

Activities relating to fisheries control and surveillance (including high tech development such as VMS) have been the responsibility of FFA. SPC and FFA hold an annual colloquium under the terms of an inter-organisational MoU. This allows the development of internal matrix between FFA and SPC on shared and collaborative responsibilities and priorities, including Projects such as SciFish. This informal mechanism allows organisations to agree on a common approach to project implementation. However, management and subsequent implementation of FFA's part of SciFish have been hampered by a series of changes incumbents of the key post of FFA Director of Operations. The incumbent has changed four times in recent years and is currently vacant.

3.2 MONITORING OF ACTIVITIES

A Project Steering Committee (PSC) was established to decide and approve the orientation and the course of the Project. The Directors of Fisheries from each of the participating countries (or their delegated representatives) are deemed members of the PSC. The PSC has met at least once per year since 2008, usually as circumstances allow, in the margins of other regional meetings. SPC has acted as Secretariat for the PSC, and a report has been produced for each meeting. Despite its important role for internal monitoring and evaluation, the PSC has no specific ToR. This means that the Committee does not have a clearly defined role. In fact, given that the PSC meetings are usually held to coincide with the HoF meeting in Feb/March each year, by then the AWP has usually been approved already by the RAOs and EU. The PSC has, therefore, not played a significant role in monitoring and evaluation of SciFish. This has not, however, led to any problems, probably due to fact that the PICs inherently trust the OFP managers to ensure that the AWPs include what is needed and what is achievable, consistent with national and regional priorities.

As is the case with all EDF-funded projects, the essential document governing organization and management is the Annual Workplan and Budget. This document is drafted each year by the Project Coordinator, who then presents it to the next available meeting of the Project Steering Committee, which theoretically performs a critical role in ensuring that the AWP is consistent with national and regional imperatives, while keeping in line with the original intent of the FA. The AWP is also approved by the Regional Authorising Officer (RAO) and the EC Delegation. The Project Coordinator maintains contact with these authorities through the respective Regional Contracting Authority (RCA) or directly through the RAO. The RAO and RCA and the Delegation also approve tendering processes and final disbursement for major procurement items and other service / supply contracts released in the project.

The level of detail provided in the AWP is superficial, and does not allow adequate evaluation of the activities. As mentioned previously, the lack of well-defined annual targets for activities prevents adequate monitoring of the progress against such targets. In addition, the format of the AWP has not been consistent over the past three years. Although an attempt has been made in the 2010 AWP to introduce SMART indicators against which to evaluate progress over the year, the variation in the format and substance of the document does not facilitate effective monitoring. The format and substance of the 6-monthly and annual progress reports has also varied. The financial aspects being the only consistently well documented aspect of the report. These shortcomings have not, however, appeared to inconvenience the PSC, the RAOs or the EU.

3.3 FINANCIAL MANAGEMENT

Financial management of SciFish has been undertaken by SPC as part of its core activity. SPC has a long and successful track record in financial management of regional projects and programmes. The experience of the financial staff within the organisation of EU rules and procedures has resulted in very efficient spend rates, within budget and in compliance with EU requirements.

OFP has access to a number of funding sources, including GEF, Australian Aid, New Zealand Aid, amongst others. Such funds support technical positions within SPC who carry out core activities. OFP exhibits a high degree of coordination and complementarity between its many fisheries projects. This is both a strength – it gives the OFP considerable flexibility to fund activities and utilize staff to maximise advantage in the achievement of the OFP strategic work plan - but it is also a considerable weakness from the project visibility aspect, since it is not generally possible for a project such as SciFish to claim sole 'credit' for any beneficial developments relating to improved fisheries monitoring, stock assessment or understanding of the pelagic ecosystem.

Funding for activities have been front-loaded, with sufficient advances paid each year to allow efficient implementation. The FA indicates that most activities would be complete within the first 3 years of the project: the fourth year set aside for winding down and succession planning for major activities to be absorbed within the OFP Strategic Plan.

A Budget Line is included for audits in the FA. This falls outside the direct costs for OCTs, but not ACPs. Financial reports have been audited each year by Price Waterhouse Coopers and are found to be a 'true and fair view' of project finances. Only minor weaknesses have been reported, in relation to non-interest generated by bank deposits, and an issue concerning bonus payments (for work conducted under ProcFish).

- Expenditure under the ACP budget as of the end of 2009 amounted to €2,440,998 (equivalent to 85% of the combined 2008 and 2009 budgets of €2,865, 500), with €1,559,002 remaining. Expenditure under the OCT budget as of the end of 2009 amounted to €1,224,242 (equivalent to 73% of the combined 2008 and 2009 budgets of €1,667,500). Remaining funds under the ACP component as of end of 2009 equalled €1,559,002, and €1,385,758 under the OCT component.
- MCS activities under the Project total budget of €580,000 (see log-frame, activities 1.6 – 1.9) are FFA's responsibility. In 2008 €210,000 was provided by SPC to FFA, equivalent to 80% of the 2008 budget of €210,000 for MCS activities in the ACP States, as provided for under an inter-organisational arrangement [4]. However, in the absence of any formal activity reports or accounts to indicate expenditure of this money, no further payments have been made.

Audits have been conducted as required under the Financing Agreement, at a cost of around €5,000 each. Funds to cover a year's work programme are only released when the audited reports for the previous year's funds have been submitted to the RAO and EU. One audit needed for the 80% advance at beginning of year, and another for the release of the remaining 20%, so they have proved to be very expensive. A single audit would be preferable. Funds are allocated to the activity from the most relevant funding sources in SPC's consolidated revenues. For example, just about all activities under Result 1 were sourced 100% from SciFish, whereas funding for activities under Result 2 and Result 3 was supplemented by other funding sources.

Front loaded activities means that spend rates are high and in line with approved AWP. Front-loading has been good for planning and fits in well with the OFP's overall work plan. The auditors note that some expenses including staff costs are allocated on a shared cost basis according to available budgets within different projects that form part of the overall OFP-approved programme. They also state that the appropriateness of cost allocation to the different projects and the compliance of expenses reflected in the Financial Statements with the objectives of the donors have been confirmed by the Programme/Section Head and Finance Manager.

In 2011, there are no activities budgeted for, and funds already received will be utilised. With the project coming to a conclusion in 2011, a decision is needed on what to do with the remaining funds as well as contingencies. OCT funding in under-spent. SPC wrote to OCTs earlier this year for views on what priorities to include in the 2011 AWP (such a letter was not issued to individual ACPs,

[4] Subsidiary Agreement between the Secretariat of the Pacific Community and the Forum Fisheries Agency for the joint implementation of the 'Scientific Support for Oceanic Fisheries Management in the Western and Central Pacific Ocean (SCIFISH)' project under Contribution Agreement No. 9.ACP.RPA.013.

because the PRIP provides the agreed framework for the ACPs). French Polynesia and New Caledonia both indicated during the MTR that they prefer to see an extension of the support provided under the Observer and Port Sampling activities (activities 1.1-1.3). Both OCTs (and also Wallis and Futuna) have full time observers, port samplers and observer coordinators in place who are currently employed under SCP contracts, plus they are supplied with operational cost support to run their respective national observer programmes.

The OCTs both prefer to maintain the current staffing arrangement rather than add these positions to their own staff establishments, but there are issues including French Labour Laws and difficulties in securing funding for the work through national budgets. Since SciCOFish will not support OCTs in the same was as SciFish has done, the issue is now coming to a head and some decisions will need to be made by the OCTs. One option would be for SPC to continue to coordinate these positions for the OCTs who simply pay SPC from national core funding. The OCT authorities are well aware that they need to find their own budget after SciFish ends (effectively mid-2011) if they are to maintain their national monitoring programmes.

3.4 IMPLEMENTATION OF ACTIVITIES

Implementing a regional project across 14 ACP and at least 2 OCT States and involving institutional linkages to numerous national, regional and international bodies is not an easy task. Fortunately, SPC is well placed to implement a Project such as SciFish efficiently due to the calibre of its core staff and its long experience and track record in the Region.

Through discussions held during the MTR and evaluation of the available documentation, it appears clear that SciFish has been implemented efficiently. Staff assigned to the Project have conducted their duties in an efficient and in some cases exemplary fashion (for example, the staff responsible for observer training). Numerous reports and high calibre scientific papers have been generated, many of these having been peer reviewed in prestigious scientific journals. National staff capacities have been enhanced in a variety of respects. Senior PIC staff, regardless of perhaps being unaware of the Project's title/acronym, are well aware of the activities it supports and the results achieved, especially in regard to matters concerning data provision and policy formulation at the level of the WCPFC.

Project activities are efficiently dovetailed into the overall core work plan of the OFC, and to a lesser extent that of the FFA. SPC and FFA meet on an annual basis to harmonise work activities, and the implementation of SciFish has been an agenda item for such meetings.

The cost of travel is relatively high in the Region, and the burden placed by attending meetings on senior fisheries staff is already onerous. An efficient approach has been used therefore to coincide meetings of the PSC with other meetings and venues, such as the bi-annual HoF meeting, FFC, etc.

Personnel interviewed expressed general satisfaction with the quality of technical expertise provided by SciFish funded staff and contracted technical assistance. The quality of documentation is consistently high, in particular in regard to training materials and the scientific papers generated.

There would appear to be no alternative strategies for tuna research and data collection to that currently being pursued. The highly migratory nature of the resources and their wide geographical range requires a regional approach both to data collection and subsequent management. The current system of data collection, research and formulation of management advice, which has been supported by SciFish, builds on previous activities and ties in directly with the strategy of the Commission. The development of national capacity for data collection will continue to form the basis of regional cooperation through the Commission. The decision has already been made to utilise existing regional structures to the extent possible, thus there is no reason to consider altering the current arrangement.

3.5 TECHNICAL PERSONNEL

Long-term technical assistant staff that have been recruited and funded under SciFish include:

1. **Observer-Port Sampler Coordinator:** Peter Sharples. Full time. 100% funded by SciFish.
2. **Observer-Port Sampler Trainer:** Sifa Fukofuka Full time. 100% funded by SciFish.

3. **Ecosystem modeller:** Valerie Allain. Funded 100% under GEF, plus a short-term TA in ecosystem modelling. Jesus Jurado Molina: 100% SciFish funded, recruited later. He is near the end of contract now, and the position will go onto SciCOFish funding in Feb 2011.
4. **Tag Recovery Officer:** 100% funded under SciFish. This post was first filled by Mr Brian Kumasi, who resigned in 2009 to return to his native PNG, where he joined NFA and will be the key tag recovery officer for the next tagging regime once this gets underway in PNG waters. Ms Caroline Sanchez replaced him, using the remaining funds under Brian's 3 year contract.
5. **Albacore Biologist**: Dr. Ashley Williams. Was 100% SciFish He changed position in Jul 2010 (now funded under SciCOFish), and this position under SciFish now vacant. There is not enough time (8 m) left to recruit anyone else, and therefore a decision is required on how to utilise the remaining funds.
6. **Fisheries Oceanographer**: Karine Briand. 100% funded (OCT component). Full time. Recruited Feb 2008. Contract up in Feb.
7. **Computer programming support**: Fabrice Bouie, data processing and ICT budget lines Budget 8.1.
8. **Financial management**: Mr Paul Judd 100% funded under the SciFish admin budget.
9. **Data entry staff**: Ms Christine N'Guyen funded 100% under SciFish Budget line 8.2.

In addition, short term TA has been recruited in line with AWPs e.g. Collecte Localisation Satellites (CLS[5]) modelling support for SEAPODYM.

Technical assistance under SciFish has been recruited in accordance with SPCs internal recruitment practices and procedures, and in compliance with the conditions laid down in the FA.

Financial/Administrative support to SciFish was provided until recently by OFP staff member Kay Parry, who was part-funded under budget line "9. Administrative support / evaluation" in the ACP component, and also from "9. Administrative support" in the OCT component. Upon her departure, Ms Parry was replaced by Mr Paul Judd (OFP staff), who is part-funded under the same budget lines.

There is a need to ensure that dedicated administration support budget line is built into future projects, because the level of support needed is considerable and has proven to be onerous as an 'add on' to existing establishment staff. In addition, dedicated project support allows better promotion and raised public awareness of project activities. This is already proving to be the case for SciCOFish, where a fully-funded dedicated support staff member within OFP is very actively promoting the Project and raising its profile through newsletters, media releases, web coverage, etc.

4 EFFECTIVENESS

4.1 ACTIVITIES, RESULTS AND PROJECT PURPOSE

The review has attempted to determine the concrete results obtained from activities undertaken under the Project to date, and the degree to which these have resulted in the achievement of the Project Purpose. The main sources of information included the documentation produced and discussions with key stakeholders and beneficiaries. Annex 7 presents a summary of the information made available in the 2008 and 2009 Annual Progress Reports and the Jan-Jun six monthly report for 2010. Web-links to scientific papers, as given in the progress reports, are provided in the footnotes.

1.1 Observer/port sampling training workshops

Results achieved to date. A total of 456 observers (basic and advanced) have been trained (by year: 2008 – 89 trainees; 2009 - 239 trainees; and 2010 – 128 trainees as of October). Observer training workshops have been held in most if not all the participating states (ACP and OCTs), and also on a sub-regional basis.

[5] Marine Ecosystem and Monitoring by Satellites, CLS, Space Oceanography Division, Ramonville, 8-10 rue Hermès, 31520, France.

Training has followed the PIRFO standard, adopted by the WCPFC. The number of trained observers has increase from around 180 in 2008 (prior to SciFish commencement) to around 600 today, as a direct result of the courses run.

The number of national observers trained to PIRFO standards now available for deployment on vessels now stands at around 600. The Maritime Training School in Kavieng, PNG, is fast becoming a centre of excellence for basic and advanced observer training.

SciFish funded TA and funds were instrumental when, in 2008, the Commission adopted CMM 2008/01, requiring 100% observer coverage for purse-seine fishing in the Convention Area. SciFish technical staff moved quickly and efficiently to organise numerous courses throughout the region in order to supply the necessary observers to the regional programme, which has allowed the target of 100% coverage to be met.

Basic courses are provided for Cadet observers and advanced course for established observers. More recently, training of trainers has been introduced, with special attention to training more experienced observers to take on a training role at home. The standard training materials used are of very high quality. Cadet level observer courses are generally of 2 weeks duration, with 15 participants per course.

The main achievement has been in capacity development for national observers, port samplers and in many countries, observer de-briefers/managers of national observer scheme. The raised level of skill and knowledge of sampling techniques has resulted in a definite improvement in coverage and quality of the various types of data collected. Training courses have been well designed, to comply with WCPFC standards, covering purse-seine, long-line and in some cases trawl vessels (to cover in the PNG trawl fisheries).

Port sampler training has involved short, on the job training. Although such training has been valuable for the albacore long-line fishery, port sampler training for purse-seine vessels has been of secondary value to the development of competent on-board observers. This because of the nature of the purse seine fishery, where the fish mix up too much on purse-seine vessels, and thus the value of data sampled at port is generally less than data taken on a set-by-set basis on board the vessel.

The standardized format of the courses has resulted in standard assessment of participants and assessment of their performance on the course through a grading system. Course topics are comprehensive and designed for the ability of the participants, and cover both scientific data collection and compliance responsibilities of on-board observers. By keeping participant numbers to 15 per course, a good instructor/student ratio has been achieved. Collaboration between OFP and FFA staff with national administrations has been effective in regard to planning, logistics, and design/delivery of courses.

1.2 Training attachments

Results achieved to date. Training attachments have been provided to fisheries MCS officers from Solomon Islands, Samoa, Cook Islands, Vanuatu, Kiribati, Tuvalu, Tokelau at OFP headquarters, Noumea. Participants were provided with a broad, comprehensive introduction to the WCPFC fishery, data collection procedures and use of current tuna databases. Training attachments typically were of 1-2 weeks duration. One or more OPF staff member assigned to the attaché, offering one-on-one expert technical help to the attaché.

PIC nationals who received such training reported a high degree of satisfaction with the experience, and felt that their skills had considerably improved, particularly in regard to data handling, database management, data analysis and statistical report writing.

Few attachments have been organised in 2010, due to the heavy work commitments of SPC staff. The annual Regional Observer Workshop held at SPC provides a good training opportunity for many observer and MCS-linked PIC officials.

1.3 Operational support for observer/port sampling programmes

Results achieved to date. Support has been provided in the form of staff costs (observers, coordinators, port samplers, national tuna data coordinators), supplies of standard equipment to be used by observers/port samplers in the course of their duties, data reporting forms (e.g. standard observer log-sheets), purchase of ICT equipment and data gathering/processing services. The cost of OFP advisory services and support for planning and establishing new observer/port sampling activities in participating countries was also covered by this activity. The types and value of support provided is set forth under agreed MoU's signed between the ACP/OCT fisheries administration concerned and OFP. The focus has been on smaller countries facing budgetary difficulties in meeting such costs. ACP supported included Cook Islands, Kiribati, Nauru, Palau, Samoa, Tonga and Tuvalu, plus OCTs: French Polynesia, New Caledonia and Wallis and Futuna.

Support provided for specific research activities has included diet analysis, collection of otoliths, tag seeding on board vessels. In the OCTs, support was continued or initiated for stomach contents sampling, otolith sampling, and deployment of albacore long-line temperature-depth recorders and hook timers.

The operational support provided was unanimously regarded as having had a very positive effect on the establishment or further expansion of national observer schemes, and has increased the contribution made by such national programmes to regional research initiatives. However, it has raised a problem for some states that have become highly reliant on the provision of operational support, particularly for staff positions in the OCT states. As discussed below in Section 3.3, both New Caledonia and French Polynesia currently face difficulties in their attempts to institutionalise observers/supervisors currently supported under SciFish into the establishment of their national fisheries administrations.

1.4 Quality control of observer/port sampling data

Results achieved to date. These activities tie in with 1.1. Observer de-briefer training and debriefing training for Observer Coordinators have been conducted in tandem with observer training, although venues and dates are not indicated in the progress reports. Training provided to observer de-briefers has aimed at improving quality control of observer and port sampler data.

Following endorsement of the Pacific Island Regional Fisheries Observer Programme (PIRFO) standards for Competency-Based Training (CBT) by FFC 67, the standards were subsequently trialled through the various observer training courses funded under the Project. The standards are available for download online.[6] For the OCTs, a French version of the CBT documentation has been developed and also available on-line, and observer debriefing and debriefing training conducted.

The Financing Agreement states that all larger national observer/port sampling programmes will be audited at least once during the course of the Project. This has not apparently occurred on a formal basis, and has been more of an informal activity of Peter Sharples' work, and has necessarily had to become secondary to the higher priority that has been placed on increasing the number of on-board observers under the Project.

Since Mar 2010, OFP has conducted an annual Tuna Data Workshop (TDW), with funding support provided by GEF, Japan Trust Fund and the UN DOALOS (United Nations, Department of Ocean Affairs, Law of the Sea). Although not funded under SciFish, the TDW has important implications for activities conducted under SciFish output 1.4. The three TDWs held to date have been variously attended by all fisheries personnel from PICs as well as from Philippines, Indonesia and Vietnam. The TWD format allows participants to simulate national audits, an OFP staff member plays the role of a bad port sampler, and participants are then required to audit him to find out what he's not doing well and suggest corrective actions.

Main elements covered during the workshop include: building knowledge and skills in determining annual catch estimate; Review the standard template for producing the Annual Report to the WCPFC;

[6] http://www.spc.int/oceanfish/Html/Statistics/Observer/PIRFO/index.htm

Provide participants with tools to conduct an audit of their tuna fishery data to ensure data of improved quality that are ultimately provided to the WCPFC. Participants are taught a series of checks to clean data, e.g. observation of cruise track maps, eyeballing data for errors, etc.

A main function of the TDW is to assist WCPFC member states and cooperating non-members of the Commission to provide tuna fishery data on annual basis, as specified in the WCPFC Convention. The TDW is run in early April, and assists PICs to be ready for data submission to Commission by 30 Apr (a crucial date for PICs every year), which is the deadline for obligations of scientific data submissions to Com (catch estimates, log-sheets and observer data). OFP has recently developed a TDW port sampling audit manual.

1.5 Develop and trial new technologies for enhancing quality of data and timeliness of data collection

Results achieved to date. The main result achieved to date has been the assessment of the 'spill sampling' methodology for sampling catches at sea by on-board observers. Analysis of historical species composition and length frequency data from observer samples showed that the 'grab sampling' method (where an observer 'grabs' fish as they come out of the net) is significantly biased, due to observers 'choosing' particular size classes or species during the sampling process. Spill sampling was therefore trialled by on-board observers, whereby fish are spilled into a bin and then all are sampled (weight, length, species composition) to reduce this sampling bias. Subsequent analysis reveals less bias in the resulting data on catch composition and length frequencies of fish. Trials started in PNG in 2008. Spill and grab sample paired data sets have been compared on 17 trips.

Measurement of the grab sampling bias has allowed correction of grab sampled data back to the nineties. OFP plans to conduct up to 50 more comparative spill sampling trips to improve the correction method, as well as trials in the use of data loggers on selected observer cruises.

It is possible that a regional standard for spill sampling may be developed, owing to the fundamental importance of having as representative and unbiased data on catches as possible.

Trials of higher-tech methods for electronic data recording (e.g. video monitoring, use of electronic callipers) have not progressed, due to higher priority placed on observer/ de-briefer training. Peter Sharples is just now reviewing developments elsewhere in world, but it would take more time and money than is available under SciFish to take further.

1.6 Develop harmonised fisheries monitoring / data sharing protocols

Results achieved to date. Finance totalling €580,000 for MCS related activities under 1.6-1.9 has been largely the responsibility of FFA to implement, and an advance of €210,000 was provided to FFA as per SciFish contractual arrangements (80% of year one budget for MCS activities).

Activities under 1.6 aimed to determine data types required for MCS, develop mechanisms to harmonise data, and training of ACP national MCS staff in order to enhance the region's MCS capabilities. The need for greater regional cooperation in MCS was identified at the 67th meeting of the FFC, where it was agreed to commission a number of analytical projects to support the development of a Regional MCS Strategy. These projects were based on five agreed 'action areas' including:

1. Assessment of risks to oceanic fish stocks from fishing that undermines fisheries management objectives and frameworks;
2. Review of FFA members' compliance with agreed MCS measures;
3. Development of a policy and framework to facilitate collection, processing, storage and exchange of fisheries data to support national, sub-regional and regional MCS initiatives;
4. Analysis of the benefits of enhanced regional MCS coordination including an examination of the methodology and functional specification for the establishment, funding and operation of a Regional MCS Coordination Centre (RMCC); and
5. Examination of options for providing an effective surveillance and response capability by identifying more efficient ways to use MCS assets (surveillance aircraft and patrol vessels) as

well as other possible providers and funding options, with a view to supplementing national programmes in the short to medium term.

A consultancy produced in 2009 by MRAG Asia-Pacific under contract to FFA sets out a Regional MCS Strategy, incorporating each of these five key action areas[7]. The overarching purpose of the Regional MCS Strategy is to support a management regime and associated measures that will ensure the long term sustainability of oceanic fish stocks and associated economic benefits flowing from them to Pacific Island Countries. However, the Strategy has yet to be implemented. FFA has to date spent €168,000 of the initial advance of €210,000 on co-funding the MRAG study.

Training of trainers of MCS support structures in the region, with associated training course materials development, has not been undertaken by FFA. Planned activities to develop harmonised regional database templates for the dissemination of MCS information, harmonized Vessel of Interests List, and rating index system to indicate surveillance priority of vessels, have been partially undertaken by FFA. A lack of executive leadership within FFA for MCS matters (vacant Director of Operations post) has probably contributed to this low performance.

1.7: Undertake compliance audits and IUU risk assessments

Results achieved to date. IUU threat analysis and compliance audits of ACPs were undertaken as part of the MRAG consultancy discussed under 1.6 above.

In June 2010, the (then) Director of Operations at FFA advised OFP of their wish to use the residual MCS funds for an information management project, as part of the MCS Strategy. A project description was provided. No further action has been taken.

1.8: Develop and implement methodologies to verify fisheries data

Results achieved to date. Activities undertaken aim to improve regional coordination of national databases that will facilitate tracking and monitoring of fisheries related data for compliance with MCS and fisheries management requirements. SciFish has supported important aspects of the developmental work on TUFMAN (Tuna Fisheries Database Management System) since 2008. TUFMAN is a database tool developed for Pacific Island Countries to manage their tuna fishery data. It provides for data entry, data management, data quality control, administration, and reporting. The system is the same throughout the region but is highly customizable and can be setup specifically for the needs of each of the individual countries. It has been developed over many years and has evolved from a simple system into a comprehensive tuna data management tool.

With SciFish support, FFA and OFP in-house experts have further developed the TUFMAN system to allow comparison of data and information derived from numerous sources, including the regional register, VMS systems, observers, vessel log-sheets, unloading (including cannery landing and reports) and transhipment reports, trade information and/or catch documentation schemes, and import/export data, at various levels of aggregation (e.g. vessel trip, annual vessel reports, flag state reports). This is turn allows 'exception reports' to be created, which highlight inconsistencies such as a catch report delivered without corresponding VMS information, VMS data with no corresponding log-sheet data, etc. Reporting is fairly comprehensive and the system can generate many reports using a single source or a combination of data types. It has a mapping component than can produce catch and effort maps as well as tracks of log-sheet, position reports, and VMS data. Special reports have been provided that cater for the countries' flag-state reporting obligations to the WCPFC, and produce specific tables and figures defined in the WCPFC reporting template.

The latest version of TUFMAN, v6.02, is hosted in-country and now widely utilized by PICs (PNG and Tokelau being the only exceptions). It can be remotely accessed by FFA and SPC (with appropriate country approval). TUFMAN is one of the most important tools available to PIC fisheries authorities and the support given under SciFish to its development and training in its use have been

[7] Safeguarding the Stocks: A report on analytical projects to support the development of a Regional MCS Strategy for Pacific oceanic fisheries. MRAG Asia-Pacific, 14 Sept 2009.

highly valuable. Marshall Islands is the best example of a country that is currently using the system to its maximum capacity.

1.9 Develop and trial new technologies, including satellite based technologies for the detection of IUU fishing activities

Results achieved to date. This activity falls under the resources provided to FFA as per SciFish contractual arrangements. A pilot study undertaken for the EEZ of New Caledonia and executed by CLS (contracted under the OCT contribution) in collaboration with the NC Service de la Pêche assessed the acquisition and processing of VMS and RADARSAT image data, and simultaneous analysis of the data sets using custom built software to match VMS records with RADARSAT targets for the detection of IUU fishing activities. The findings were not positive for the technologies examined. No subsequent action on the report by the NC authorities appears to have been taken.

A second consultancy to evaluate other emerging technologies, such as optical satellite data collection and Unmanned Aerial Vehicles (UAVs) for fisheries surveillance, has not been undertaken.

2.1 Large-scale conventional and electronic tagging / biological studies

Results achieved to date: (a) Skipjack, yellowfin and bigeye

Large-scale tuna tagging is a centre-piece activity of the Project that supports the continuing efforts of the wider Pacific Tuna Tagging Programme[8]. The PTTP is implemented by OFP, PNG National Fisheries Authority (NFA) and the members and participating non-members of the WCPFC. Its main goal is to improve stock assessment and management of skipjack, yellowfin and bigeye tuna in the Pacific Ocean through a tagging programme and associated data collection activities in the WCPO. PTTP is now the biggest tagging experiment in the World, having successfully tagged over 260,000 tuna.

The EU is one of several funding agencies supporting the PTTP, in the recent past through PROCFish (8th EDF) and currently SciFish (€500k, in direct support). Other donors include the PNG National Fisheries Authority, NZAID (NZ$5m), the Government of the Republic of Korea (US$1 m), Australian Centre for International Agricultural Research (A$400k), the French Pacific Fund, the Government of Taiwan and the Global Environment Facility ((US$0.5-1.0 m, through the Pacific Oceanic Fisheries Management Project). PNG has also funded US$250,000 in past operations, and has recently contributed US$3 million for forthcoming phase of RTTP, a cruise in the PNG EEZ. Such a large contribution from a member SPC state underlines the importance attached to the methodology for improved stock assessment and management of tuna resources.

Since inception in mid-2006, PTTP has undertaken 13 separate tagging cruises in two distinct phases. Phase 1 (August 2006-April 2008) focused very successfully upon the waters of Papua New Guinea and the Solomon Islands with their large domestic fisheries and significant contribution to overall regional catches (two cruises in PNG EEZ and three in Solomon Islands EEZ). Phase 2 (May 2008-November 2010), extended the tagging operational area and broadened the scope and operations of the PTTP. Three pole-and-line based tagging cruises were completed in the western Pacific waters, operating from Indonesia and Philippines in the west (120°E) to Kiribati (180°) in the east. For the Central Pacific (140°W – 170°W) where pole-and-line operations are difficult, two multi-purpose hand-line vessels based in Hawai'i were used to tag and release primarily bigeye tuna in this area, over the course of four separate cruises in 2008, 2009 and 2010.

The cruises undertaken in 2009 - 2010 succeeded in considerably expanding the PTTP coverage of the WCPO. The large number of recoveries already received suggests that mechanisms to receive and

[8] PTTP has four specific objectives: (1) collection of data to assist and reduce uncertainty in WCPO tuna stock assessment such as exploitation rates, natural mortality, movements and growth rates, and their spatial and temporal variability; (2) Obtain information on the rates of movement and mixing of tuna in the equatorial WCPO, between this region and other adjacent regions of the Pacific basin, and the impact of FADs on movement at all spatial scales; (3) obtain information on species-specific vertical habitat utilisation by tunas in the tropical WCPO, and the impacts of FADs on vertical behaviour; and (4) obtain information on local exploitation rates and productivity of tuna in various parts of the WCPO.

return recaptured tags are working well, and that good results can be expected in the longer term, in fulfilment of project objectives.

With the number of PTTP releases now over 260,000, the project has over-achieved its nominal target numbers, although bigeye numbers are still lower than hoped. Tag recoveries continue to be received, with an overall return rate of 14.7% to date. As more tags are returned the return rate is expected to exceed 15%. By comparison, the tuna tagging programme undertaken in the Indian Ocean has cost €20m, and only about one third as many fish tagged as the RTTP has achieved, and with far fewer tag returns.

Verification and further analyses of tag data will continue be a main focus of PTTP. Besides tagging with 'normal' dart tags, approximately 1,000 fish have been tagged using two types of electronic tags: archival tags which record depth, temperature, geographic position and horizontal/vertical movements; and sonic tags, which send a signal to hydrophones in water, thus logging when a fish is in a particular area. This work reveals tuna behaviour around FADs (residence time and movement patterns). Electronic tags track real movements, and are important for setting spatial boundaries within the Multifan-CL stock assessment model. The main drawback with archival tags is their cost (around US$4,000 each).

The RTTP has good cooperation with fishing groups in Korea and China, with whom analytical results are shared. This has led to improved tag returns, since commercial operators they feel they are part of important research. This two-way interaction with industry has proved very valuable.

Tag recovery stands at around 40,000 to date (15-18% skipjack, 20% bigeye, 20% yellowfin). Tagging surveys are well documented and subject to peer review in respected international scientific journals. They are also published on the OFP website and Commission website. CMM/2009-02 on FAD closures was a direct result of scientific advice provided through OFP tagging.

The WCPFC has established a steering committee to advise the Commission on this work. The success and importance of tagging as a basic method for obtaining information that supports subsequent stock assessment is well recognized, to the extent that numerous donors continue to support these activities. Future support from the WCPFC is likely owing to the importance of this work.

Results achieved to date: (b) Albacore

For the OCTs, tagging and biological research supported under SciFish has focused on South Pacific albacore, which since the early 1990's has formed the basis of domestically-based long-line tuna fisheries of OCTs (New Caledonia and French Polynesia, and to a small extent Wallis and Futuna, which has one locally-based long-liner) as well as Pacific Island Countries such as Fiji, Samoa, Tonga and Cook Islands. Fleets operating from these bases now account for nearly half the annual harvest. Annual catches have increased steadily year on year, from around 30,000 t in the 1990's to around 70,000 t in recent years. The long-line method accounts for most of the catch, and a smaller amount by surface trolling.

SciFish funding (OCT component) has been used to support a three year albacore tagging project (jointly developed by OFP and FFA) to improve the stock assessment models, through obtaining independent estimates of fishing mortality through tagging studies, and to obtain further information on movement patterns and independent estimates of growth.

The first phase of albacore tagging cruises was completed in early 2009. The main objective was to tag albacore with conventional tags in an effort to obtain information on exploitation rates and movement. The cruises also provided the opportunity to conduct an experiment to validate the age of albacore derived from hard parts such as otoliths and spines. A New Zealand commercial troll fishing vessel was chartered to fish the west coast of the south island of New Zealand between January and March 2009. Overall, a total of 2,766 albacore were tagged and released with 1,457 of these fish also receiving an injection of oxytetracycline for age validation experiments.

A second albacore tagging cruise supported by SciFish commenced in March 2010. Albacore were tagged in the subtropical front, east of New Zealand in an effort to spread the tagging effort across the south Pacific and to facilitate the mixing of tagged fish within the entire population.

Several tagging cruises completed in New Caledonia, New Zealand and Tonga. The primary objectives were to tag larger albacore than were tagged in 2009 in an attempt to increase tag recapture rates and also to release 30 satellite archival tags (miniPATs) to obtain detailed information on movement patterns.

Long-lining was the principal fishing method used to catch albacore for tag and release. Catch rates and the condition of albacore landed varied significantly between locations, but generally a large proportion of albacore landed were unsuitable for tag and release. As a result, only 92 albacore were tagged with conventional tags and 19 with miniPATs. All conventional tag releases were in New Zealand where the proportion of albacore landed in good condition was substantially higher than in other locations.

OCT and ACP Observers and port samplers trained through the Project were fully engaged in the albacore work.

2.2 Analysis of tagging, biological and fishery oceanographic data

Results achieved to date: (a) Skipjack, yellowfin and bigeye

Stock assessments for the four key species using the Multifan-CL model rely heavily on tagging data. Such data provides information on the population structure and has a large impact on the assessments generated.

Multifan-CL is the first model of its type. Other similar packages exist (e.g. Length-based A-SCALER, CASEL, which NZ uses, but not good for tuna, Stock Synthesis, used by IATTC, but has limitations).

A mid-term review of the PTTP was conducted in February 2010 at SPC, Noumea, by world renowned experts in tuna stock assessment and tagging data analysis. The review noted that the implementation of the PTTP has been highly successful as evident by the high numbers of tuna tagged and broad spatial coverage. A significant reason for this success was attributed to the past experience of the project team who were involved in the implementation of the RTTP. The Review identified some key issues for future tagging activities, some of which are included under recommendations for use of funds remaining under SciFish.

The analysis of tagging and other biological data generated by the tropical tuna and albacore tagging cruises by OFP scientific staff is on-going and will continue for several years. Tagging data has been used to adjust biological parameters and spawning biomass calculations for yellowfin tuna in the WCPO. Analyses of vertical and horizontal movements and exploitation rates has been undertaken. Preliminary stock assessment models for south Pacific albacore, yellowfin, and bigeye have been drafted. Data analysis on FAD retention effects has been completed.

Numerous reports have already been produced and widely disseminated through websites (OFP, WCPFC), newsletters, and through peer reviewed scientific journals.

A major output is the presentation of Multifan-CL outputs to the Commission's Scientific Committee, where results are discussed and management implications considered. The SC gives a certain level of scientific review, although the quality of feedback is proportional to the technical capacity of the participants. Each paper has recommendations for further research and management implications. The deliberations of the SC are then passed to the plenary Commission meetings for further discussion and to inform policy formulation and input to the elaboration of Conservation and Management Measures (CMMs) of the WCPFC.

Results achieved to date: (b) Albacore

Albacore tagging supported SciFish has now concluded. Analysis and write up of results is now underway. The New Zealand campaign focused on juvenile albacore. A major problem with the albacore tagging has been the fragility of the species and the high mortality rate incurred by the long-

line catch method. By the time fish are brought to the long-line tagging vessel, most are not in suitable condition for tagging. It is unlikely that sufficient fish have been tagged in order to estimate exploitation rates. Tagging for albacore has consequently been of less successful that that for the other three key species.

A number of lessons have been learned from the albacore tagging program that can inform any future plans to tag albacore:

- Most albacore captured by trolling or long-lining are unsuitable for tag and release (depending location and fishing method).
- In New Zealand, a greater proportion of albacore were landed in good condition by using long-lines (>50%) than by trolling (~34%): long-line caught fish at tropical latitudes have a very high proportion of dead or injured fish which and unsuitable for tag and release.
- Albacore caught at temperate latitudes are generally smaller than those caught at tropical latitudes, but the use of long-lines can significantly increase the size of fish caught.
- Tag recapture rates of albacore are likely to be very low irrespective of capture method. Consequently, a large number (10's of thousands) of albacore may need to be tagged to gain useful information from tagging.
- The use of pop-up satellite archival tags (PSATs) offers the opportunity to obtain movement data without the need to recapture the fish. This is particularly useful for species such as albacore that typically have low recapture rates.
- Alternative methods for obtaining information on exploitation rates and movement for albacore should be explored due to the difficulties in the application of traditional tagging programs.

There is no plan to continue albacore tagging under SciCOFish. This was reported as a concern by the fisheries administrations in New Caledonia and French Polynesia, who will continue to require good albacore science to inform policy regarding local basing and fish availability for their domestic albacore fleets. Owing to the problems encountered with tagging albacore, other methods are under consideration including otolith microchemistry for stock structure and movements, and tetracycline injections for age determination.

Some pop-up satellite tags have been used, with fish released in New Zealand, New Caledonia and Tuvalu, in an attempt to obtain information on see E-W movements and distribution. It is hoped that data will be forthcoming over the next 12 months, which will inform the albacore stock assessments currently underway.

The Multifan estimate of stock levels is highly sensitive to growth estimates, therefore continued work on growth rate estimates is essential. The 2010 SciFish work plan includes collection of gonads, spawning biomass/age maturity in the first 6 months.

As with the papers generated from skipjack, yellowfin and bigeye tagging, papers detailing the albacore tagging are presented to the Commission's Scientific Committee, where results are discussed and management implications considered.

2.3 Incorporate data / analytical results into stock assessment models

The incorporation of tagging data and/or analytical results into stock assessment models is on-going. The resulting papers are used to advise PICTs and the WCPFC (through the SC) on the status of skipjack, yellowfin, bigeye and albacore stocks within the region. The primary stock assessment model, MULTIFAN-CL, uses tagging data directly to improve the veracity of the stock assessments made. Various papers are listed in Annex 7 that are generated from these activities. PTTP data has been included in the 2010 skipjack stock assessment. Albacore reproductive ogives and growth curves have been estimated.

To assist developing state members or cooperating non-members of the WCPFC develop national capacity and expertise to interpret and use scientific information from regional tuna stock assessments and Ecological Risk Assessments (ERA) in order to meet their regional (and domestic) fisheries management decision making processes, OFP has, since 2006, run annual stock assessment and

ecological risk assessment workshops for fisheries officers from developing member states of the Commission (usually held at SPC headquarters). These workshops have been funded by multiple sources, including GEF, SPC, ProcFish-Oceanic, WCPFC, Government of Japan and since 2008 SciFish-OCT component. 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.

3.1 Ecosystem model development and enhancement

The SEAPODYM model was initially developed in 1995 to investigate spatial tuna population dynamics and the interactions between fishing and environmental factors, as an adjunct to the SPRTRMP tagging experiment between 1995 and 2000, and later under ProCFish-Oceanic Component between 2002 and 2005.

Since 2006, development has continued within the MEMMS section (Marine Ecosystem Modelling and Monitoring by Satellites) of the Space Oceanography Division of CLS, a subsidiary of the French CNES and IFREMER Institutes.

In February 2008, SciFish funds were used to contract CLS-MEMMS, over a two year period, to further develop the SEAPODYM model and documentation, and to conduct in collaboration with SPC a series of applications for Pacific tuna populations and fisheries.

CLS has consequently developed a new version of the SEAPODYM model. This version includes a general framework to use fishing data, both catch and fish size distribution of the catch, to achieve optimal optimization of parameters for each species. This is as a key step since it generates confidence for the estimates produced by the model.

Several tools for assisting in optimization experiments and analyses of results have also been developed. Model configurations with optimal parameterization for each major tuna species have been completed, allowing the development of various applications such as the study on fishing closure areas or EEZ scale analysis.

CLS and the SciFish-funded Ecosystem Modeller have further developed the model to include the potential impacts of climate change on fish distribution and therefore availability. This will become increasingly important for those countries currently establishing domestic fishing industries (catching, processing) that need to consider how supply chains of raw material might be affected by climate change over time. It will inform decision making on investment strategies.

The development of supporting software to implement new standard formats for input and output files is about 90% complete. SEAPODYM code clean-up and documentation has been completed. An MSY extraction code has been developed. Mixed resolution models have been developed for PNG and Kiribati. Parameterisation of the model for South Pacific albacore is complete, and documentation of the South Pacific albacore SEAPODYM model has been prepared.

Remaining work under SciFish work will focus on further development and application of the SEAPODYM model, including revision of some aspects of the population dynamics of the model.

3.2 Use of models for research / management applications

Slow but steady progress is being made in regard to tangible fisheries management applications. Activities are currently underway (and will continue until the end of SciFish funding), conducted by both OFP and the contracted modelling company (CLS) to investigate:

- The correlation between environmental factors and tuna recruitment for use in tropical tuna and albacore stock assessments;
- the impact of closing areas of ocean to fishing as a fisheries conservation measure; and
- EEZ-scale analysis for South Pacific albacore in the New Caledonia EEZ.
- The inter-relationship between variation in oceanographic variation on locally-based fishery performance in specific EEZs.

The last point has important future implications for predicting the potential impact of global warming scenarios on Pacific tuna fisheries. SEAPODYM utilises tuna biology and satellite data derived oceanographic information to give predictions of tuna distribution, which is then superimposed on fishery-related information to observe interactions. This can be applied to areas where no data is currently lacking, to give likely tuna abundance /distribution information e.g. for East Timor. The main deliverable of SEAPODYM is a way of knowledge integration into a format useful for specific countries. Published documentation includes papers on EEZ-scale evaluations of tuna fisheries for selected ACPs using the SEAPODYM model (Annex 7).

Development of SEAPODYM has progressed to allow investigation of the likely impact that fishing in one EEZ will have on the general stock. It also enables modelling of fishing tactics at regional and national (EEZ) scales, to see how the fishery is affected by oceanographic events such as El Nino / La Nina events, which directly impact catches, and are important considerations in industry planning. Reference points for tuna and non-target species can also be generated.

SEAPODYM and MULTIFAN are two mutually supportive models. MULTIFAN generates CPUE parameters, SEAPODYM includes parameterisation (i.e. fitting of the model to the data). Together they represent a very powerful set of tools for Pacific fishery managers and policy makers. A 3rd model used by OFP scientists is ECOPATH/ECOSYM (not SciFish funded), which models marine food webs. ECOPATH incorporates observer data, by-catch etc. and is able to estimate how the trade-off of tuna catches against other species (e.g. by-catch species such as sharks) changes over time. This complements both MULTIFAN-CL and SEAPODYM, but is several years behind them in terms of development.

Within the next 3-5 years the 3 models are set to become more complementary and will provide excellent guidance to policy makers and fisheries managers in the region. The issue of by-catch is set to become more important for PICs and thus the need to able to provide tools that can address such concerns can only increase. PIC governments will continue to need advice on impacts and mitigation options, and so all 3 models are expected to become more important in years to come. The developmental work on such models needs to continue to increase their reliability, together with improved data inputs from fisheries monitoring and research.

Coastal fisheries have been the focus of ecosystem models elsewhere in the world, but never before has this sort of model been applied to pelagic ecosystems on a large scale. The science is therefore cutting edge. There is now considerable confidence in the model and its indicative outputs. Publications of outputs in the scientific literature to date are indicated in Annex 7, and continued publication is essential to ensure that the science faces up to international scrutiny through the peer-review process in reputable scientific publications. Continued publication would be a good use of remaining OCT funds is the focus on publications.

The production of fine scale resolutions is a priority for the 2011 SciFish AWP. Funds remaining could usefully be used for the preparation of high resolution examples of the SEAPODYM model outputs.

4.2 ACTIVITIES AND RESULTS IN THE CONTEXT OF THE PROJECT PURPOSE

In the context of the Project Purpose (provision of a scientific basis for regional and national regional and national oceanic fisheries management), the scientific data and information at regional level yielded through the Project's activities has been used successfully to inform decision-making process at the level of the WCPFC in formulating a number of CMMs. The SC has held six regular meetings between August 2006 and August 2010. Of the six CMMs passed in 2008 and 11 in 2009, the data and information resulting from activities supported by SciFish, was particularly instrumental in the formulation of seven of them:

- CMM/2008-01: Conservation and Management Measure for Bigeye and Yellowfin Tuna in the Western and Central Pacific ocean;
- CMM/2009-02: Conservation and Management Measure on the application of high seas FAD closures and catch retention;

- CMM/2009-03: Conservation and Management of Swordfish;
- CMM/2009-04: Conservation and Management of sharks;
- CMM/2009-05: Conservation and Management Measure prohibiting fishing on data buoys
- CMM/2009-06: Conservation and Management Measure on regulation of transhipments;
- CMM/2009-10: Conservation and Management Measure to monitor landings of purse-seiners at ports so as to ensure reliable catch data by species.

SciFish activities have also assisted in national fisheries administrations as well as the FFA in the implementation of three CMMs in particular, developed and approved in 2007:

- CMM/2007-01: Conservation and Management Measure for the Regional Observer programme.
- CMM/2007-02: Commission Vessel Monitoring System.
- CMM/2007-03: Conservation and Management Measure to establish a list of vessels presumed to have carried out IUU fishing activities in the WCPO.

CMM/2008-01 and 2009/02 are landmark measures and were formulated with significant input from the OFP (and FFA) SciFish supported activities. CMM/2008-01 had significant stock assessment input from the OFP (using MULTIFAN) – both before (on the assessment of options) and after implementation (on the assessment of outcomes/impacts). At the 2009 Scientific Committee session SEAPODYM was formally incorporated into the WCPFC 5-year Research Plan.

The Scientific Committee has always served a critical role for the Commission. Despite attempts during 2006/2007 by some one WCPFC member in particular to seriously politicise it, it is fair to say that decision-making in WCPFC will continue to endeavour to be driven by best available science, despite the virtual impossibility of completely side-lining politics in such regional bodies.

The stock assessment work under Result 2 and Eco-modelling under Result 3 are works in progress. The tagging experiments have yielded valuable information and this has significantly contributed to the understanding of the major tuna stocks in the region. Scientifically-valid stock information is a fundamental requirement of effective policy formulation and implementation of cogent management measures. The work of the Commission would certainly have been made more difficult without the high quality advice the OPF has been able to provide.

Although SEAPODYM is very much in the developmental stage, its potential to inform on crucial issues such as the impact of long term changes in the oceanographic environment due to factors such as climate change and El Nino is of direct relevance to the region, and therefore sustain the Project Objective.

The data emanating from SciFish has also been used as major input to numerous technical meetings held at FFA, prior to the conduct of annual meetings of the Tuna Commission and its sub-committees. Examples of such meetings, attended by the Consultant during this Review, include the FFC sub-committee on South Pacific Tuna and Billfish, the PNA Long-line Vessel Day Scheme Technical Working Group, and the FFA Management Options Consultation (preparation for the next session of the Tuna Commission). Such technical meetings are instrumental in ensuring the engagement of PIC officials in interpretation of the results emanating from the science, and consequent input in the process leading to formulation of tuna management options and negotiating positions with the DWFN membership of the Commission.

FFA has assisted at least six P-ACPs in drafting tuna management plans, with scientific input provided by OFP. Tuna fishery management plans are listed in the Project logical framework as a source of verification for the single OVI set for the Project Purpose (improved management plans and policy frameworks through scientific and monitoring information for better management of the fishery). The countries assisted include:

- Vanuatu (revised Tuna management plan: a national policy for the management of Vanuatu tuna fisheries, drafted 2009)
- Marshall Islands (Marshall Islands Tuna Management and Development Plan, 2009-2011),
- Samoa (drafted 2010 for period 2011-2015),

- Tonga (drafted 2009 for the period 2010-2014),
- Cook Islands (drafted 2010),
- Niue (drafted 2010)

These plans set out, in varying degrees and formats, a strategic roadmap of commitments and statements of intent of the government and other stakeholders to ensure rational and sustainable exploitation of tuna resources falling under national jurisdiction. The plans generally provide background information on the current state of the tuna resources, catch and structure and functions of the tuna industry; an overview of international obligations and regional cooperative measures affecting tuna management; and core issues affecting tuna management and development and strategic actions to be undertaken over prescribed time lines. The essential need for accurate data on which to develop effective domestic and regional fisheries management and monitor their efficacy, as well as for meeting national obligations to regional bodies to provide data, is highlighted in these plans. The plans have in the most cases been well received by PIC, but it is not possible to determine their effectiveness to date in guiding specific actions in tuna fishery management and development by the states concerned.

4.3 UNFORESEEN BENEFICIARIES AND CONSEQUENCES

The main stakeholders and beneficiaries have been the WCPFC, and the Pacific ACP and OCT Governmental departments involved in tuna fisheries management at national level. The ACP and OCT states are now more able to effect their data reporting obligations to the Commission as a result of Project support. Other organisations have also benefited through capacity enhancement of the people the work with, particularly FFA and the PNA group.

Other beneficiaries have included private sector actors involved in, for example, chartering arrangements for tuna tagging vessels and the associated economic activities (provisioning, wharf fees, etc.). The observer training activities have also assisted to some degree PNG to further enhance its role as a competent regional centre for observer training at basic and higher levels.

4.4 REALISATION OF ASSUMPTIONS

As discussed in 2.5.1, Project effectiveness has not been negatively impacted by the validity of the project assumptions, which have been met.

Even the most potentially problematic assumption (ACP and OCT governments will commit to implementing fishery monitoring methods as recommended by the project) appears to be holding true.

4.5 USE OF PROJECT RESOURCES

It is evident that all human, financial and material resources provided under SciFish (Technical Assistance and other personnel, equipment, training, research, etc.) have been procured in accordance with the agreed procedures, and fully employed in pursuit of Project activities and result.

The Project support staff members listed in section 3.2.4 were recruited through open competition, in line with SCP standard procedures. Without exception, they have been of high calibre and well able to achieve their respective tasks. The fact that some have successfully applied for similar positions under the successor SciCOFish Project attests to their capabilities.

There have been no incidents of disciplinary action taken against any of the SciFish staff. It must be said that the high calibre of management provided by SPC staff has been instrumental to the success to date of the Project.

The MCS/IUU related activities that were the responsibility of FFA to implement were hampered in large by senior staff changes during the course of the project in the Operations Section (the Director's position is currently vacant).

5 IMPACT

The terms of reference call for a comparison (if possible) of the scenario immediately prior to the implementation of the Project with the achievements of the project to date. This is not possible, since no baseline study on the circumstances facing the WCPFC or the participating ACPs and OCTs was conducted during the project preparation phase. However, given the preceding discussion on results to date, the Project has clearly had some beneficial impact. There have been no negative impacts.

5.1 IMPACT ON QUANTITY/QUALITY OF TUNA FISHERIES DATA COLLECTION

Improved fisheries monitoring has been the largest single impact of SciFish, resulting in improved data and other forms of biological and operational information for the use of national administrations as well as feeding into the regional process to inform policy and management decision making.

Very important basic data has been collected on the region's tuna resources, and bigeye tuna in particular, a species for which data necessary for understanding stock status and devising appropriate conservation and management actions was previously lacking.

Building of national capacity of observer programmes has been highly significant and has resulted in WCPFC meeting the obligation to achieve 100% observer coverage on purse-seine vessels. One impact of the observer programme has been to enhance data collection and improve compliance with CMMs. The impact of better and more comprehensive data collection flows directly to assist improve stock assessment activities for the target species. Another impact of observer coverage is an increased capacity for the regional partners to assess the effectiveness of the Commission's CMMs.

In the OCT states, SciFish supported observer coordinators have built very effective relationships with skippers of long-line vessels, and pass to them concise, easy-to-understand reports summarizing the data and information collected by observers and port samplers. This has led to very good cooperation between national management authorities and the industry.

Considerable human resource development has been achieved. Operational support (funding for staff and equipment) has had major beneficial impact on monitoring systems at national level throughout the region.

For those PICs that are making adequate commitments to human, financial and material resources for fisheries management, such data and information is being well used. OFP however continues to undertake a large portion of analytical work, and thus further capacity needs to build in-country, particularly in regard to stock assessments.

Many more PIC nationals are now available for deployment in the regional fisheries observer programme than was previously the case. The adoption of the PIRFO Standards provides a career structure (from cadet through to Observer Manager) which was lacking previously.

Regional coordination between the Commission, SPC, FFA and the national administrations has been further strengthened in support of controlling in-zone fishing and the wider regional control dimension.

The MCS strategy developed under the FFA component has had less immediate impact, but sets an appropriate framework for improved integrated MCS in the future.

The impact of national tuna management plans that have been developed is hard to judge. These plans form a useful framework for planning the sustainable development and management of national tuna resources.

5.2 IMPACT ON KNOWLEDGE OF STATUS OF TUNA STOCKS AND FISHERY INTERACTION

Further development of database systems (TUFMAN) will have a major lasting impact on the ability of national authorities to meet their reporting obligations to WCPFC.

Improvements made to stock assessments through data generation (tagging) and model development (MULTIFAN-CL) are set to have an impact on establishing scientifically-based CMMs for tuna

resources. Writing up and publication of this work is continuing. Peer review and further consideration of results at Commission level is certain to increase the impact.

The tagging conducted in the central Pacific has revealed the vulnerability of bigeye to purse-seine fishing and justifies PNA moves to close the eastern part of the fishery (East of 180 deg East Longitude). 30% of tags released in this area were recovered by purse-seine vessels (mostly EU flag), indicting a very high exploitation rate for bigeye tuna by a relatively small level of fishing effort. PNA will propose closure of the high seas areas for purse-seine vessels between 10N – 20S and East of 170 E longitude to the Tuna Commission.

Donor coordination and support for monitoring, tagging and model development is good and likely to continue, given successes to date.

Several PICs voiced concern that national fisheries staff and decision makers have insufficient understanding of the models and the stock assessments they produce, and have to rely totally on OFP scientists. The impact of the models being developed could be enhanced by building capacity within the PIC fisheries administrations though training on the interpretation of stock assessment results and how to use them in policy and management decision-making processes. The annual stock assessment workshop conducted by OFP (not SciFish funded) is an example of how this is improving.

It is not possible to determine the extent to which SciFish alone has contributed to these impacts, but it certainly has had a positive synergistic effect.

5.3 IMPACT ON SCIENTIFIC UNDERSTANDING OF THE WCPO PELAGIC ECOSYSTEM

Modelling activities under result 2 have had a moderate impact to date because of the developmental nature of the work, and will therefore take a long time to produce tangible results, but will increase in time. MULTIFAN-CL and SEAPODYM are mutually supportive and offer the prospect of predicting the effects of climate change on the tuna fisheries – a politically charged issue that is sure to increase in importance over time.

6 SUSTAINABILITY

6.1 POLICY SUPPORT

Many SciFish activities and corresponding results have successfully built on activities that began in earlier EU-funded interventions (e.g. capacity building, data collection and analysis systems, tagging experiments and model development in support of an ecosystem approach to fisheries management).

The fishery monitoring activities under Result 1 all involve the continuation, enhancement and extension to the full, post-Cotonou Pacific ACP group of activities to develop national observer and port sampling capacities, which were initiated under PROCFish/Oceanic (refer Annex 6).

The longer-term sustainability of activities which aim to build national capacities will take time, and will require sufficient allocation of resources primarily by the national governments themselves, to invest in their own personnel and fisheries management structures. SciFish and its predecessors have clearly made a significant contribution to national capacity building, and through this has provided invaluable support to the work of regional organizations such as SPC, FFA, PNA and the WCPTC.

There remains considerable gap, however, between the technical capacity of personnel in the ACPs and OCTs: both between the countries themselves and between the region as a whole and the levels commonly found in the Pacific Rim countries. There is a need for the PIC governments to explore ways and means to reduce the level of dependency of aim-funded projects such as SciFish, and to pass at least some of the costs of fisheries monitoring, control and management to the users of the resource – the fishing industry. Progress in the Region is already being made in this regard, for example FFA's Regional Register of Fishing Vessels, the FFA regional VMS scheme, and the costs of observer emplacements on-board purse-seiners operating under the US Treaty, are all subject to 100% cost recovery from the vessels concerned.

The activities under Result 2 (stock assessment) are of less concern in regard to future sustainability. The results of the tagging experiments to date have laid a solid foundation for scientific advice generation, and will be of value for many years to come. Similarly, models for stock assessment and SEAPODYM will continue to be more refined overt time – these are deliverables that SciFish has contributed to which will have fundamental significance for the region far into the future, and increasingly so as commercial interest in exploitation of tuna resources continues to grow.

SciFish has a natural extension, SciCOFish, which has already commenced (refer Annex 6). The objective is the conservation and sustainable use of oceanic and coastal fisheries resources in the Pacific Islands region. The project purpose is to improve the management of oceanic and coastal fisheries by Pacific ACP (and OCT) Governments and by relevant regional fisheries management authorities, through the provision of a reliable scientific basis for decision-making. Project results are envisaged in two areas: (a) Pacific ACP (and OCT) governments, the Forum Fisheries Agency (FFA) and the Western and Central Pacific Fisheries Commission (WCPFC) are provided with scientific data, modelling, and advice on oceanic fisheries to underpin their management decision making and strategic positioning; and (b) Pacific ACP (and OCT) governments, private sector and communities are better equipped to monitor coastal fisheries to provide scientific advice in support of sustainable management of these resources. SciCOFish therefore builds on earlier interventions, particularly those undertaken during SciFish. It will provide support for the further development of reliable estimates of the status of fisheries resources across the region, as well as the impact of management measures.

Beyond SciFish and SciCOFish, additional requirements for external assistance from the EU, as part of the range of donor-interventions enjoyed by the region, will surely be forthcoming through the deliberations of the WCPFC and its technical advisory committees (particularly the Scientific Committee and the Technical and Compliance Committee). The high level of political support for continued assistance, in tandem with measures to increase the adoption of 'user pays', is unlikely to diminish.

6.2 ECONOMIC AND FINANCIAL ANALYSIS

The terms of reference for the MTR call for a cost effectiveness analysis to be conducted. This is very difficult to undertake, as discussed with the EU at the start-up and de-briefing meetings, due to (a) the difficulty in quantifying the economic benefit of policy and management changes resulting from a project that has in large part been one of several funding sources for such change; (b) no baseline survey of the situation was undertaken immediately prior of Project commencement.

A simplistic approach is to look at the cost of the project compared to the value of the tuna fisheries to the Pacific ACPs and OCTs.

According to FFA[9] (2010):

- Total tuna production in WCPO in 2009 was 2.43 million metric tonnes with an estimated value of US$4.084 billion (€3.087 billion[10]).
- Of this 1,137,248 tonnes valued at US$1.56 billion (€ 1.18 billion) was caught in waters of FFA member countries.
- The FFA fleet (local and locally-based foreign) caught 417,353 tonnes valued at US$618 million (€467 million).

The total cost of SciFish is €6,610,000 ($8,741,725) over for years, or €1,652,500 ($2,185,000) per year. The annual cost of SciFish therefore accounts for 0.14% of the annual landed value of tunas taken in FFA member states' waters.

The cost of the Project is therefore insignificant in these terms, but the impact it has had, although intangible, is high. Intangible benefits that have accrued to the region as a result of having in place an

[9] Value of WCPO tuna fisheries (for wide distribution). FFA, Honiara, November 2010.

[10] Conversion rate of 0.756 euro to the dollar.

effective management and control system includes increased contribution to national GDP, direct and indirect employment creation in fishing related activities on vessels and ashore, plus employment creation for observers, and foreign exchange through export of tuna and tuna products. Given the socio-economic value of the resources and the essential need to ensure policy and management frameworks for WCPO tuna resources based on reliable and timely data and scientific analyses, it is clear that the SciFish project represents excellent value for money.

6.3 COMMUNITY ACCEPTANCE AND OWNERSHIP

All stakeholders and beneficiaries consulted indicated a high level of support for the activities and objectives of SciFish. Although in some stakeholders interviewed were not familiar with the Project by name, they were without exception conversant with the main activities and consequent results that the Project has supported and unanimous support for the Project.

The widespread support for the activities to take place under SciCOFish, which largely constitute an extension of those initiated or continued under SciFish, is tacit recognition of the value of SciFish. The role of the Steering Committee, however, has not been dominant. Feedback from PIC officials on Project AWPs has been low level, but this may be a reflection of the fact that the executive role of the Steering Committee was not made clear in the original Project design.

It may also be that, due to the very high degree of understanding of national and regional needs in regard to tuna fisheries management and development by the staff of the OFP, the content of AWPs has always been commensurate with both the purpose and intent of the Project and the expectations of the participating states.

6.4 APPROPRIATE TECHNOLOGY

The Project has successfully built on previous interventions in regard to technology developments. Equipment used for monitoring by observers and port samplers is applicable and sourced in region.

The region does, however, face numerous ICT problems. Old hardware /software and lack of virus protection in some national administrations can cause a direct impact on the timely preparation and dissemination of required data formats. These are generic problems not related to the activities initiated SciFish. There is a large variation between PICs in regard to the national level of ITC development and the corresponding use to which deliverables such as TUFMAN, regional VMS, can be used effectively and efficiently.

Tagging equipment – use of electronic tags was problematic and expensive, bit this is not a concern for the PICs, more an issue for OFP in planning future tagging activities.

6.5 INSTITUTIONAL AND MANAGEMENT CAPACITY

OFP management of SciFish has been exemplary. FFA involvement also excellent, however current high level staff constraints (Director of Operations) has resulted in slippage of the MCS related activities under SciFish.

SciFish has helped to galvanise the national and regional collaboration in fisheries monitoring as an essential requirements for policy formulation and management. The relationship between WCPFC and SPC/OFP and FFA is well established and growing, and due to the well-established technical skills of these two regional agencies, the prospects for sustainability are good.

The role and responsibility of the PIC national partners, as stewards and owners of the region's tuna resource owners and the primary clients of the WCPFC, SPC and FFA, is fundamental to the continued realisation of the SciFish Overall Objective: The science and the management that it supports will only ever be as good as the data upon which it is based.

The primary data collectors (on-board observers, port samplers) and their quality managers (de-briefers, observer managers) have been well supported by the Project, through salary support and recurrent cost support. The national observer programmes in many ACP States are localised and sustainable. However, in the OCTs, there is the prospect that once SciFish stops, data collection will

too. As indicated in Annex 6, SciCOFish will support further observer training and fisheries monitoring systems for the ACP States, but this is only delaying the day when the PICs themselves must assume the full costs. Cost recovery schemes are need whereby the cost of fisheries management, including research, monitoring, as well as control and surveillance, are passed on to the resource user.

The lack of detail given in the Progress Reports has been discussed. OFP gave the opinion that given very high workloads, the minimum reporting required under the terms of the FA has been adhered to. In hindsight, it would have been better, both for the quality of reporting and for the dissemination of better information about the Project, to have ensured that a budget line is included for dedicated staff to undertake administrative tasks, rather than rely on existing OFP core staff to add these chores to their existing activities.

There is an issue however concerning the High Level Forum on Aid effectiveness held in Paris in March 2005 ("The Paris Declaration"), to which the EU has been a strong supporter. Although generally in line many of requirements (through a broad consultative processes which integrates overseas development aid into mainstream planning , support based on related national, regional and provincial, and sectoral plans, use of use country/regional systems and procedures to the maximum extent possible) the financial support of in-country staff (observers, de-briefers etc.) contradicts the requirement in the Paris Declaration 'to phase out paid incentives for government officials administering aid financed activities and to not establish incentives in future'. Continued donor support for such personnel is therefore not in line with the Paris Declaration. Such national staff positions should best be institutionalised, although in the short term this is problematic for some states, especially the OCTs who have a preference for retaining the status quo, whereby staff who are currently supported by SciFish continue under SciCOFish, or alternatively they pay SPC from their own core budgets to contact directly.

Ideally, the cost of fisheries monitoring and research in support of improved management should be passed to the resource users – the fishing industry. Steps in this direction have already been made, (e.g. the regional register, regional VMS, and cost of observer coverage on the US Treaty purse seine vessels, which are 100% funded by industry).

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 PROJECT DESIGN

The overall design of the project is appropriate for enhancing the provision of high quality, accurate and reliable scientific data and information on regional tuna fisheries for formulation of policy and management at both regional and national levels. The strategy that has been employed follows that successfully used in previous EU funded interventions.

The **Overall Objective** is fully consistent with the Fisheries Focal Sector stated in the 9th EDF PRIP, in that it has promoted regional cooperation between Pacific Island States in policy formulation, and coordinating effective policy delivery through the implementation appropriate management measures through the aegis of the Tuna Commission. The design of the Project also contributes to the attainment of MDG's no.1 (poverty alleviation, employment creation) and 7 (environmental sustainability, resource stewardship).

The **Project Purpose** responds directly to the Pacific Regional Indicative Programme (PRIP) para 144, which calls for the improvements in scientific information on oceanic marine resources and their ecosystem. The three results and activity focus has been well designed to enhance the effectiveness of the WCPFC, in line with PRIP para 145. The Project Purpose has also helped PICs to meet certain obligations to FAO in regard to realisation of the Code of Conduct (National and Regional Plans of Action (e.g. on IUU fishing, sharks, vessel overcapacity).

The **results** and their respective activities are specific, relevant and ultimately achievable, albeit in some cases not within the lifespan of SciFish. The three result areas logically flow one to the other.

The **logical framework** provides a sufficient indication of broad intent. However, the lack of SMART OVI's in the SciFish log-frame, and the poor quality of the descriptive text of the Annual Work Plan and Budget (AWPs) documents, as well as the 6-monthly and annual reports, presents difficulties for effective monitoring and evaluation of SciFish achievements.

SciFish's **assumptions** and pre-conditions have all proved to hold true and have had no negative impact on Project implementation. This is fortunate, given that no regular appraisal and reassessment of assumptions was undertaken.

7.1.1 Relevance

There is widespread support from senior PIC officials for the relevance of the Project. However, the visibility of the project in terms of its name is not high. The Project's formal title and acronym were not immediately recognised by many of the people consulted, however all recognised the role of the EU in the key areas of support provided.

OFP exhibits a high degree of coordination and complementarity between its many fisheries projects. This gives OFP considerable flexibility to fund activities and utilize staff to maximise advantage in the achievement of the OFP strategic work plan, but this in turn also means that project 'visibility' is lost, since it is not generally possible for a project such as SciFish to claim sole 'credit' for any beneficial development relating to improved fisheries monitoring, stock assessment or understanding of the pelagic ecosystem.

The ability of PIC nationals to make meaningful contributions to the many and varied sub-regional meetings of the SPC, FFA and WCPFC continues to develop. Experience, understanding and consequently confidence levels are rising. The 'ownership' by PIC national of such meetings, their outcomes and the processes by which they feed into conservation and management measures that level of the Commission is clearly apparent at the recent set of FFA meetings attended during the MTR.

7.1.2 Recommendations

- The AWP should include a revised logical framework, with target SMART objectively verifiable indicators for results and target indicators for activities.
- The PSC should thoroughly examine the validity of the logical framework and provide real feed-back during the annual PSC meeting.
- The assumptions and preconditions given in the logical framework should be subject to regular appraisal and reassessment by the PSC, to ensure that such factors that impact on Project success are given adequate consideration in work plan formulation, and necessary amendments made.
- To increase project visibility, SPC should consider developing specific information on SciFish on the SPC OFP website.
- Given that a number of activities will be concluded between before the programmed end of the Project in mid-2011, it is recommended that a final evaluation of SciFish be undertaken as part of the SciCOFish Mid-Term Review (presumably mid-2012).
- Dedicated support staff should be considered for funding support, whose role it would be to ensure that progress reports are comprehensive and adequately report on developments against the OVIs and targets.

7.2 EFFICIENCY

7.2.1 Organisation and Management arrangements

SPC's OFP has been highly efficient in its role as Lead Agency for SciFish. The organisation and management of SciFish closely follows similar arrangements for previous EDF funded projects executed through OFP. OFP senior personnel have long experience of EDF/EU terms, conditions and procedures. This has resulted in efficient, even exemplary implementation. SciFish funding has created significant synergies with other complementary activities being implemented through the OFP's Strategic Plan.

FFA has been an effective technical partner organisation, responsible for control and surveillance activities (including high tech development such as VMS). A formal MoU between the two organisations was established for collaboration on SciFish. SPC and FFA hold an annual colloquium, which allows the development of internal matrix between FFA and SPC on shared and collaborative responsibilities and priorities, including Projects such as SciFish. However, implementation of FFA-driven activities under SciFish has been hampered by four changes of incumbent in the key post of FFA Director of Operations (the position is currently vacant).

Annual Workplan and Budget documents have not conformed with standard log-frame theory. For 2008 and 2009, they lacked SMART OVIs for Project results. No specific target reference points have been given for activities planned during the course of the year. SMART indicators and targets should preferably be presented in the form of a revised Log-frame each year, against which to report progress in the 6-monthly and annual Progress Reports. In addition, the format and content of the AWP has not been consistent over the past three years. The budget has however been consistently well documented.

An attempt has been made in the 2010 AWP to introduce SMART indicators against which to evaluate progress over the year, as a result of a Results Orientated Monitoring mission carried out earlier this year. However, the variation in the format and substance of the AWP does not facilitate effective monitoring.

The format and substance of the 6-monthly and annual progress reports has also varied, with the financial aspects being the only consistently well documented aspect of the report. These shortcomings of the AWP have not, however, appeared to inconvenience the stakeholders and beneficiaries, or the efficiency of project implementation.

The Project Steering Committee (PSC) has met three times, with EU and RAOs present as observers to decide and approve the AWP. The PSC, as a monitoring body, has played a minimal role in ensuring the efficiency of implementation. The FA provides no specific **Terms of Reference** for the PSC, which may have diminished its effectiveness.

Financial management of SciFish has been undertaken by OFP as part of its core activity. SPC has a long and successful track record in financial management of regional projects and programmes. The experience of the financial staff within the organisation of EU rules and procedures has resulted in very efficient spend rates, within budget and in compliance with EU requirement. Financial reporting has been good. Necessary derogations have been applied for an approved in accordance with EC rules. Flexible responses have been used in regard to cash flow issues (e.g. year 1 cash shortfall due to rapid TA recruitment). Spend rates have been excellent: 99% committed and 77% spent overall.

Implementation of activities has been efficient and, in the case of OFP, most results have been achieved, or will be by the end of the Project. For MCS-related activities falling under FFA's responsibility, results have been partially achieved, primarily due to a lack of continuity in the key post of Director of Operations. Flexibility and the ability to respond to changing circumstances has been displayed, e.g. the extra effort placed on observer training order to meet the Commission's requirement for 100% observer coverage on purse-seiners. Recruitment of long-term technical assistance staff funded under the Project was achieved the first year, resulting in an efficient start-up phase. Recruitment followed the standard SPC staff recruitment practices and procedures.

The long experience in the Region and deep understanding of the fisheries sector of senior OFP managers has been a major contributory factor in the efficient management of the Project. The experience of the financial staff within the organisation of EU rules and procedures has resulted in very efficient spend rates, within budget and in compliance with EU requirements

7.2.2 Recommendations

- Develop specific Terms of Reference for the Project Steering Committee (probably not useful for SciFish, but more for successor projects), to ensure effective on-going monitoring and evaluation as well as oversight of the direction of the project.
- Increase visibility of project achievements by developing specific information on SciFish on the SPC OFP website.

- Include dedicated administration support budget line into future projects.

7.3 EFFECTIVENESS

Progress reports provide inadequate levels of detail for the technical activities undertaken and results generated. Only the financial aspects of the Project are reported on in depth. The lack of well-defined OVIs and specific targets for the different activities set forth in the AWPs contributed to this situation. Reference to scientific papers within the reports without providing a summary of what such contain is not instructive.

7.3.1 Achievements under Result 1: Enhanced Oceanic Fishery Monitoring

1.1 Observer/port sampling training workshops

- Observer training workshops have been held in most if not all the participating states (ACP and OCTs), and also on a sub-regional basis.
- The design and delivery of training courses has been appropriate. The flexibility of the approach used has resulted in achieving rapid production of trained national observers, required for deployment in support of Commission CMM 2008/01.
- A total of 456 observers have received training, increasing the pool of national observers available for deployment under the WCPFC Regional Observer Programme from around 180 to over 600 during the course of the project.
- Training materials are of very high standard, designed to comply with PIRFO standard, adopted by the Commission. Observation of the major vessel types is catered for.
- Training of trainers is now a feature of such courses, leading to the creation of a cadre of national teachers and further capacity building of national observer programmes.
- Raised skill levels and knowledge of sampling techniques has resulted in a definite improvement in coverage and quality of the various types of data collected.
- Collaboration between OFP and FFA staff with national administrations in regard to planning, logistics, and design/delivery of courses has been excellent.
- Training of port samplers has been secondary. On-board, catch-specific data is of more scientific value that scientific information sampled at point of landing, due to the nature of catch mixing in the fishery, and also due to the very high priority that was afforded to rapidly expanding the regional cadre of competent on-board observers.

Conclusion: results have been highly effective.

1.2 Training attachments

- Attachments to OFP were undertaken by fisheries officials from 7 ACP States, typically of 1-2 weeks duration.
- One-on-one technical help provided, resulting in high transfer of skills and understanding.
- Attachees indicated a high degree of satisfaction with the experience, and felt that their skills had considerably improved, particularly in regard to data handling, database management, data analysis and statistical report writing.

Conclusion: results have been highly effective.

1.3 Operational support for observer/port sampling programmes

- ACP States supported included; Cook Islands, Kiribati, Nauru, Palau, Samoa, Tonga and Tuvalu. OCTs: French Polynesia, New Caledonia, Wallis and Futuna.
- Type and value of support provided is set forth under agreed MoU's between ACP/OCT fisheries administration concerned and the OFP.
- Material support has included standard equipment for uses by observers/port samplers, data reporting forms, direct funding for salaries of observers/port samplers/ coordinators, and data gathering/processing services, cost of OFP advisory services and support for planning and establishing new observer/port sampling activities, and costs of specific research activities, e.g. diet analysis, collection of otoliths, tag seeding on board vessels.

- For the OCTs, support has also included the cost of continued stomach contents sampling, otolith sampling, and deployment of albacore long-line temperature-depth recorders and hook timers.
- The support has resulted in expanding existing national observer schemes and increased contribution to regional research initiatives.
- PICs now need to focus on full institutionalisation of monitoring staff posts into national establishments and cost-recovery from industry.

Conclusion: results have been highly effective

1.4 Quality control of observer/port sampling data

- These activities tie in with 1.1. Observer de-briefer training courses, conducted in tandem with observer training.
- Field auditing of national programmes (FFA responsibility) was undertaken as part of the MCS Strategy.
- For the OCT states, de-briefer training was provided to national coordinators by OFP staff.
- OFP's annual Tuna Data Workshop (not SciFish funded) has positive impact on quality control of national fisheries monitoring systems.

Conclusion: results have been effective

1.5 Develop and trial new technologies for enhancing quality of data and timeliness of data collection

- Trials of grab and spill catch sampling methodologies has quantified the degree of bias inherent in grab sampling.
- Grab sampling bias now being corrected in historical sample data, and used to re-assess previous stock assessments that used the biased data.
- Trials of higher-tech methods for electronic data recording for at-sea and dockside situations (e.g. video monitoring, use of electronic callipers) did not take place, due to higher priority placed on observer/port sampler and de-briefer training.

Conclusion: results have not been effective.

1.6 Develop harmonised fisheries monitoring / data sharing protocols

- A planned consultancy to determine the most effective mechanism to operationalize the Niue Treaty Subsidiary Agreement (NTSA) which provides the legal framework for sharing information, was not undertaken.
- A consultancy to develop standardised indexes and templates to identify and determine data and databases in the region that may be harmonised to enhance MCS and fisheries management was undertaken as part of the MCS Strategy. This strategy has yet to be acted upon by FFA.
- Training of trainers of MCS support structures in the region, with associated training course materials development, has not been undertaken (FFA).
- Planned activities to develop harmonised regional database templates for the dissemination of MCS information, harmonized Vessel of Interests List, and rating index system to indicate surveillance priority of vessels, have been partially undertaken (FFA).
- A lack of executive leadership within FFA for MCS matters (Director of Operations) has probably continued to this low performance.

Conclusion: results have not been effective.

1.7: Undertake compliance audits and IUU risk assessments

- A consultancy to develop a strategic approach to combating IUU fishing, IUU threat analysis and compliance audit of ACPs commissioned by FFA and report produced[11]. However, this needs now to be turned into reality.

Conclusion: results have been moderately effective

1.8: Develop and implement methodologies to verify fisheries data

- FFA and OFP in-house expertise, as part of their on-going core activities, has further developed the Tuna Fisheries Management (TUFMAN) database system to allow comparison of data and information derived from numerous sources, including the regional register, VMS systems, observers, vessel log-sheets, unloading (including cannery landing and reports) and transhipment reports, trade information and/or catch documentation schemes, and import/export data, at various levels of aggregation (e.g. vessel trip, annual vessel reports, flag state reports).
- This is turn allows 'exception reports' to be created, which highlight inconsistencies such as a catch report delivered without corresponding VMS information, VMS data with no corresponding log-sheet data, etc.
- The TUFMAN database is hosted in-country and widely utilized by PICs. It can be remotely accessed by FFA and SPC through country approval. Marshall Islands is provides and exemplary model a model of the way TUFMAN should be used, and the potential of the system.

Conclusion: results have been highly effective

1.9 Develop and trial new technologies, including satellite based technologies for the detection of IUU fishing activities

A pilot study undertaken for the EEZ of New Caledonia and executed by CLS (contracted under the OCT contribution) in collaboration with the NC Service de la Pêche assessed the acquisition and processing of VMS and radarsat image data, and simultaneous analysis of the data sets using custom built software to match VMS records with radarsat targets for the detection of IUU fishing activities. No subsequent action on the report by the NC authorities appears to have been taken.

A second consultancy to evaluate other emerging technologies, such as optical satellite data collection and Unmanned Aerial Vehicles (UAVs) for fisheries surveillance, was not undertaken.

Conclusion: results have not been effective.

7.3.2 Recommendations

4. For each PIC (ACPs and OCTs) assess the level of support for continued data collection (human resources, operational costs) and identify appropriate measures for continued support (SciCOFish, WCPFC, donors). This could be conducted as part of the annual Tuna Data Workshop.
5. Include tag seeding training in recognised observer training courses.
6. Direct donor funding of national posts and running costs is contrary to the Paris Declaration and should gradually be phased out and these costs incorporated into national establishments. Future project design should consider the 'use-pays' principle and move towards cost recovery from the industry.
7. In the meantime, given the very real constraints facing New Caledonia and French Polynesia, fishery monitoring support should be extended into 2011 as far as funding allows, at least until June 2011.
8. National Sampling Coordinators and the National Observer Coordinators in New Caledonia and French Polynesia will not be supported after June 2011. The OCTs have opted not to be

[11] Safeguarding the Stocks: A report on analytical projects to support the development of a Regional MCS Strategy for Pacific oceanic fisheries. MRAG Asia-Pacific, 14 Sept 2009.

part of SciCOFish, and thus the OCTs should be encouraged to institutionalise these posts and their associated recurrent costs as soon as is practicable.

9. In the meantime, extend National Sampling Coordinators in New Caledonia and French Polynesia as far into 2011 as possible.
10. Increase cooperation with Indonesia and Philippines on fisheries monitoring, particularly in regard to catch and effort, due to the impact of those fisheries on yellowfin and bigeye.
11. To improve local sustainability for the initiatives supported by SciFish, the data collected from the various activities should be used locally for rapid reporting and decision-making by increased emphasis on developing local capacity for conducting analysis.
12. Develop a regional standard for spill sampling, for the guidance of on-board observers, and include in observer training curriculum.

7.3.3 Achievements under Result 2: Enhanced stock assessments

2.1 Large-scale conventional and electronic tagging / biological studies

- SciFish has provided significant support to tag tropical tunas (skipjack, yellowfin and bigeye tuna), successfully conducted across a wide area of the tropical western Pacific, as well as associated activities such as measures to aid return of recaptured tags. Over 260,000 tagged fish and a tag return rate of around 15% makes this the most successful tagging experiment in the world.
- For the OCTs, tagging and biological research supported under SciFish has focused on South Pacific albacore, which forms the basis of OCT domestic tuna fisheries.
- OCT and ACP Observers and port samplers trained through the project have been fully engaged in the tagging cruises.

Conclusion: results have been highly effective

2.2 Analysis of tagging, biological and fishery oceanographic data

- Analysis of tagging and other biological data generated by the tropical tuna and albacore tagging cruises by OFP scientific staff is on-going and will continue for several years.
- Results have already started to provide essential information useful for stock assessment on these species.
- Preliminary results have been reported in peer reviewed scientific journals and received international acclaim. Reports are also disseminated through websites (OFP, WCPFC), and newsletters journals.

Conclusion: results have been highly effective

2.3 Incorporate data / analytical results into stock assessment models

- The incorporation of tagging data and/or analytical results into stock assessment models is on-going. The primary model used for stock assessment is MULTIFAN-CL, which uses tagging data directly to improve the veracity of the stock assessments made.
- A major output has been the presentation of scientific papers to the Commission's Scientific Committee, where results are discussed and management implications considered.
- The deliberations of the Scientific Committee inform the plenary Commission meetings for policy formulation and input to the elaboration of Conservation and Management Measures (CMMs) of the WCPFC.

Conclusion: results have been highly effective

7.3.4 Recommendations

3. Identify ways to fund the establishment of national and/or sub-regional Tag Return Officers in all unloading/processing points, especially in regard to transhipment and long-line.
4. Continue Tag Recovery Officer position within OFP for as long as possible into 2011. With considerable numbers of tags still being received, and important tag seeding work on-going,

support for this position is critical and there is no equivalent position funded by SciCOFish. In the longer term (beyond 2011) SPC should locate other resources to support this position.

7.3.5 Achievements under Result 3: Enhanced understanding of the pelagic ecosystem

3.1 Ecosystem model development and enhancement

- SciFish support to the further development of SEAPODYM has successfully built on earlier support provided through earlier EU-funded projects (SPRTRAMP and PROCFish).
- Specific deliverables through SciFish support has included: SEAPODYM code clean-up and documentation (100% completed); Development of supporting software to implement new standard formats for input and output files (90% completed); Revision of some aspects of the population dynamics of the model (100% completed); and Development of a version of SEAPODYM that can estimate parameters from fisheries data and the application of parameter estimation to various data sets (100% completed).
- This work has been conducted by OFP staff working (particularly the Ecosystem Modeller) and contracted company CLS.
- For the OCT countries, a mixed-resolution SEAPODYM model has been developed which has particular significance for the South Pacific albacore stock.
- SEAPODYM has huge potential for tuna fisheries management in the Region. The software documentation that has been developed needs to be regularly maintained to reflect further developments. A number of scientific papers have already been published on the model, and publications are critical to ensure international peer review and confirmation that the science and the model are sound.

Conclusion: results have been moderately effective

3.2 Use of models for research / management applications

- Activities are currently underway (and will continue until the end of SciFish funding), conducted by both OFP and the contracted modelling company (CLS).
- On-going work is investigating: (a) the correlation between environmental factors and tuna recruitment for use in tropical tuna and albacore stock assessments; (b) the impact of closing areas of ocean to fishing as a fisheries conservation measure; and (c) the inter-relationship between variation in oceanographic variation on locally-based fishery performance in specific EEZs.
- The latter has important future implications for predicting the potential impact of global warming scenarios on Pacific tuna fisheries.
- Senior PIC staff are expressed comprehensive support of the ecosystem modelling approach, and are very keen to obtain mutually-supporting tools such as MULTIFAN-CS and SEAPODYM for use at both national and regional levels for prediction of fishery/environmental interactions, as well as the longer term need for mitigation measures for climate change impacts (which is set to become increasingly high on the region's political agenda)
- The potential of the SEAPODYM model to predict dynamics of tuna stocks at EEZ level in response to factors such as climate change, and estimating the impacts of locally-based fishing industry and environmental impact on tuna availability justifies the very high regional relevance of SEAPODYM to policy formulation for effective tuna fisheries management.
- SciCOFish will take this further, producing a national report for each PIC using the model to estimate environmental micro- and large scale tuna stock status, and predicting the likely impact of climate change on stocks. Reports are being created for all 15 ACPs plus East Timor. The bio-economic component of SciCOFish will use the model for bio-economic analysis.

Conclusion: results have been moderately effective

7.3.6 Recommendations

11. Extend Fisheries Oceanographer position as far into 2011 as possible.
12. Support targeted additional in-port biological sampling of albacore otoliths/gonads in French Polynesia and Cook Islands (where observer sampling has proved difficult), for micro-chemistry analysis.
13. Contract out laboratory analysis of gonads and otoliths (for specific things that OFP is not equipped to do).
14. Support further diet and muscle isotope analysis.
15. Support a tagging cruise of short duration (1-2 weeks) to deploy additional PSAT tags on albacore.
16. Publish national-level tagging reports on OFP website (password controlled).
17. Publish results of tagging cruises/data analysis in peer-reviewed journals to ensure international recognition and validity.
18. Ensure all scientific publications also translate to readily identified policy/management actions for consideration at Science Committee and Commission level.
19. Publish results of SEAPODYM model development in peer reviewed journals, to ensure international recognition and validity.
20. A non-technical summary of project outputs should be included in reports for wider distribution to fishery managers. Efforts should be focused on how to ensure that national fishery managers can best understand how to translate the scientific results into practical use for formulating policy and management options.

7.4 ACTIVITIES AND RESULTS IN THE CONTEXT OF THE PROJECT PURPOSE

SciFish has already certainly achieved its Project Purpose: the provision of a scientific basis for regional and national regional and national oceanic fisheries management. SciFish has clearly assisted in building competencies at national level. Monitoring of tuna fishing vessels has improved, data collected is of higher quality and the tools to store, analyse and share it have been expanded and improved.

Result 1 has already yielded improved information that has been used effectively in the formulation of Commission CMMs. Data analyses and report generation that are currently on-going will further inform the process before the end of SciFish. Significant national capacity building has been achieved. Monitoring of tuna fishing vessels has improved, data collected is of higher quality and the tools to store, analyse and share it have been expanded and improved.

The tagging experiments undertaken under Result 2 have yielded valuable information and have significantly contributed to the understanding of the major tuna stocks in the region. SEAPODYM development has progressed significantly under Result 3, and this paves the way for practical application at both the national and regional levels for predicting likely future scenarios of fishery/environment interaction.

The numerous technical meetings held at FFA to formulate management options and positions prior to the conduct of annual meetings of the Tuna Commission and its sub-committees are instrumental in ensuring the engagement of PIC officials in interpretation of the results emanating from the science, and consequent input in the process leading to formulation of tuna management options. The meetings attended during this review of the FFC sub-committee on South Pacific Tuna and Billfish, the PNA Long-line Vessel Day Scheme Technical Working Group, and the FFA Management Options Consultation (preparation for the next session of the Tuna Commission) are some examples where OFP, FFA and PIC personnel freely explore the results emanating from the science and use it as the basis for identifying policy and management options.

National tuna management plans, developed by FFA with scientific input provided by OFP, set out, in varying degrees and formats, a strategic roadmap of commitments and statements of intent of the government and other stakeholders to ensure rational and sustainable exploitation of tuna resources falling under national jurisdiction. The plans have in the most cases been well received by PIC, but it

is not possible to determine their effectiveness to date in guiding specific actions in tuna fishery management and development by the states concerned.

7.5 UNFORESEEN BENEFICIARIES AND CONSEQUENCES

The main stakeholders and beneficiaries have been the WCPFC, and the Pacific ACP and OCT Governmental departments involved in tuna fisheries management at national level. The ACP and OCT states are now more able to effect their data reporting obligations to the Commission as a result of SciFish support. Other organisations have also benefited through capacity enhancement of staff involvement with SciFish, particularly FFA and the PNA group.

incidental beneficiaries have included private sector actors involved in, for example, chartering arrangements for tuna tagging vessels and the associated economic activities (provisioning, wharf fees, etc.). The observer training activities have also assisted to some degree PNG to further enhance the potential for Kavieng Maritime College to develop as a competent regional centre for observer training at basic and higher levels.

7.6 REALISATION OF PROJECT ASSUMPTIONS

Project effectiveness has not been negatively impacted by the validity of the project assumptions, which have been met. Even the most potentially problematic assumption (ACP and OCT governments will commit to implementing fishery monitoring methods as recommended by the project) appears to be holding true.

7.7 USE OF PROJECT RESOURCES

It is evident from audit reports and interviews that all human, financial and material resources provided under SciFish (Technical Assistance and other personnel, equipment, training, research, etc.) have been procured in accordance with the agreed procedures, and fully employed in pursuit of Project activities and result.

Technical Assistance posts have been filled through open competition, in line with SCP standard procedures. They are without exception of high calibre and well able to achieve their respective tasks.

The high calibre of management provided by TA staff has been instrumental to the success to date of SciFish.

As previously mentioned, the use of funds made available to FFA for MCS/IUU related activities has been hampered by three changes in the Director of Operations post (currently vacant).

7.8 IMPACT

The impact of the monitoring and scientific research aspects of SciFish (OFP responsibilities) has been high. The impact of MCS activities (FFA responsibilities) has been low.

Improved fisheries monitoring has been the largest single impact, resulting in improved data and other forms of biological and operational information for the use of national administrations as well as feeding into the regional process to inform policy and management decision making.

Considerable human resource development has been achieved. Operational support (funding for staff and equipment) has had major beneficial impact on monitoring systems at national level throughout the region.

Many more PIC nationals are now available for deployment in the regional fisheries observer programme than was previously the case. The adoption of the PIRFO Standards provides a career structure (from cadet through to Observer Manager) which was lacking previously.

Further development of database systems (TUFMAN) will have a major lasting impact on the ability of national authorities to meet their reporting obligations to WCPFC.

Improvements made to stock assessments through data generation (tagging) and model development (MULTIFAN-CL) are set to have an impact on establishing scientifically-based CMMs for tuna resources. Writing up and publication of this work is continuing. Peer review and further consideration of results at Commission level is certain to increase the impact.

Regional coordination between the Commission, SPC, FFA and the national administrations has been further strengthened in support of controlling in-zone fishing and the wider regional control dimension.

The MCS strategy developed under the FFA component has had less immediate impact, but sets an appropriate framework for improved integrated MCS in the future.

The impact of national tuna management plans developed by FFA with OFP input is hard to judge at this stage. These plans form a useful framework for planning the sustainable development and management of national tuna resources, as well as meeting regional obligations for submission of tuna fishery data.

Donor coordination and support for monitoring, tagging and model development is good and likely to continue, given successes to date.

It is not possible to determine the extent to which SciFish alone has contributed to these impacts, but it certainly has had a positive synergistic effect.

There have been no negative impacts.

7.9 SUSTAINABILITY

SciFish will not be extended *per se*. Many of its activities are included in the design of the SciCOFish Project (See Annex 6, relations between EU funded Projects). As noted in section 3.4 of the Financing Agreement, the OFP is itself the main mechanism that will provide continuous follow-up of project results beyond SciFish, and will be in a position to follow up on and realize the value of SciFish results.

Follow-up on the results of SciFish are already being pursued through SciCOFish, which has been designed to complement and continue many of the activities supported under SciFish. SciCOFish is intended to broaden the growing pattern of cooperation between the Pacific ACP countries and the EC in fisheries. The overall objective is the conservation and sustainable use of both oceanic and coastal fisheries resources in the P-ACP region. It addresses a key aspect of the Regional Indicative Programme (RIP), namely, the development of cost-effective solutions for the sustainable management of marine and land-based resources. It directly responds to the P-ACP leaders' Vava'u Declaration and the 2008 Forum meeting in Niue, which called for comprehensive fisheries conservation measures, both in EEZs and on the high seas, and the sustainable and effective management of national coastal fisheries.

SciCOFish's Project Purpose is to provide a reliable and improved scientific basis for management and decision making in both oceanic and coastal fisheries. Continuing the history of EU funded support to the region, SciCOFish will provide the P-ACP countries with the means to develop efficient management measures, the skills to monitor their effectiveness, and some important tools to combat IUU fishing on the high seas. The Project's 'demand-driven' approach to implementation will ensure that assistance is provided to those countries which are most likely to take up management advice.

The EU is a major consumer of the tuna products exported from the region. EU flag vessels are already enjoying the benefit of fishing in the region. It is therefore in the EU's interests to continue to support regional programmes that aim to ensure the long-term sustainability of the fisheries. The EU should therefore continue to support programmes that strengthen national and regional cooperative efforts to improve monitoring of fishing as the basis of good planning, policy and management.

The relationships between national administrations and regional agencies has been strengthened, and prospects are good for sustained regional coordination and cooperation at all levels. It should be noted

though that there is considerable discrepancy between the PICs in terms of their economic ability to sustain the quality of their national monitoring systems. For states where fisheries management is well supported (e.g. PNG) continued support for monitoring, tagging, modelling and associated activities, in support of PNA and the wider Commission mandate can be expected. For some other states, institutionalising the costs of staff and their running costs will be more problematic. This is particularly the case for OCTs, which face problems in absorbing the currently SPC-contracted staff and their associated operational costs into their establishments.

Donor commitment to the Paris Declaration (including the EU) requires the phasing out of donor support for 'parallel structures' within national administrations, including project-funded national observers, de-briefers etc., in preference to building more on institutionalised staff, systems and procedures to effect project delivery.

7.9.1 Recommendations

- Although most of the Project's activities will continue under SciCOFish, the PICs ultimately need to ensure institutionalisation key positions such as on-board observers and observer de-briefers. PICs need to make provision for adequate human, financial and material resources by PICs in national establishments and recurrent budgets for long-term sustainability of the monitoring programmes.
- In the longer term, such costs need to be passed on to the resource users (fishing industry) and the 'user-pays' principle applied.

8 LESSONS LEARNED

1. EU Projects such as SciFish tend to underestimate the work involved to achieve the Project Purpose and planned results. It invariably takes longer and is harder than anticipated. SciFish's ambitious Project Purpose makes it implausible to have strict time limits for delivery of results. Human resource development through training and upgrading of skills is never ending, but the inclusion of SMART OVIs in the original log-frame would have assisted in gauging the specific success of the Project in this regard.
2. IUU-related activities are not suitable for a project being implemented by OFP, which remains primarily a science-orientated organisation. The MCS and IUU activities that fell under the responsibility of FFA have lagged behind, despite the close cooperation that exists between the two organisations. In hindsight, it may be more appropriate to keep science and compliance/ enforcement issues separate rather than have them included in a single project.
3. Integrated funding is strength (flexibility in provision of financial support to activities) and a weakness (no visibility for the donor).
4. There is a need to include dedicated administration support budget line is built into future projects, because the level of support needed is considerable and has proven to be onerous as an 'add on' to existing establishment staff. This is the case with SciCOFish and is already yielding benefits through improved visibility of the project (web site, newsletter etc.).
5. Given the pre-eminent importance of ensuring that as many recaptured tagged fish are discovered as possible, it would be logical to include tag return officers in key points in the tuna supply chain in future.

Annex 1: Terms of Reference

EUROPEAID/ 119860/C/SV/multi

LOT N° 6: Environment

REQUEST N°: 2010 /247943

SPECIFIC TERMS OF REFERENCE - MID-TERM EVALUATION

Scientific Support for Oceanic Fisheries Management in the western and central Pacific Ocean (SCIFISH) 2007 - 2010

FED/2006/018-725

9 ACP RPA 13 & 9 PTO REG 8

1. BACKGROUND

The specific objective of the Fisheries Focal Sector of the 9th EDF Pacific Regional Indicative Programme (PRIP) is the conservation and optimum exploitation of fish stocks in the Western and Central Pacific by promoting regional cooperation and coordination of policies aimed at eradicating poverty and securing maximum benefits for the people of the Region. The overall objectives and purpose of the SCIFISH project directly address this regional strategy. The measures to be taken by the project will enhance scientific information on oceanic marine resources and their ecosystem.

The project will contribute to the effectiveness of the Western and Central Pacific Fisheries Commission (WCPFC) both through direct support of the Commission's science programme and by assisting Pacific ACPs and OCTs to meet their obligations to collect and provide relevant fisheries data and biological information. The project will ensure continuity of scientific data collection, analysis, scientific advice generation and capacity building until such time as the Tuna Commission is fully functional and in a position to take major financial responsibility for some or all of these programmes. It will also build regional and national capacity in Monitoring Control and Surveillance of regional tuna fisheries with the overall aim of eliminating illegal, unregulated and unreported (IUU) fishing. The major policy measures to be taken by the Region as a contribution to the implementation of the response strategy in this sector are:

- Ratification of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.
- Conclusion of negotiations for the establishment of a Commission for the implementation of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.
- Promotion of the principles enshrined in the International Code of Conduct for Responsible Fisheries.

The Convention referred to above received sufficient ratifications to bring it into force in June 2004. At the time of writing, all major fishing nations (including the European Community on behalf of its Member States) and all coastal states with the exception of Indonesia and the United States had ratified the Convention. It is expected that these remaining countries will ratify the Convention in the near future.

The Commission has also now been established as a result of the Convention coming into force. Its first three annual sessions have been held in Pohnpei, Federated States of Micronesia, in December 2004 and 2005 and in Apia, Samoa in December 2006. The Commission has appointed an Executive Director, who is now establishing the Secretariat and a new headquarters in Pohnpei.

The International Code of Conduct for Responsible Fisheries is a voluntary instrument rather than a formal legally-binding agreement. However, the Code is widely and strongly supported by Pacific

ACPs and OCTs and is strongly promoted by the SPC Marine Resources Division, the Forum Fisheries Agency (FFA) and other regional organisations.

SCIFISH builds upon previous and current EC-funded projects implemented by the Oceanic Fisheries Programme (OFP) of the Secretariat of the Pacific Community (SPC), which is the regional focal point for tuna fisheries science and data acquisition (as elaborated in the OFP Strategic Plan 2006−2008). These previous projects the Pacific ACP and French Pacific OCT Regional Oceanic and Coastal Fisheries Development Project (PROCFish – 8th EDF), the South Pacific Regional Tuna Resource Assessment and Monitoring Project (SPRTRAMP – 7th EDF) and the Regional Tuna Tagging Project (RTTP 6th EDF) have developed methodologies in various technical areas, including ecosystem modelling, fishery monitoring and tuna tagging, which are highly relevant to SCIFISH. A Mid-Term Evaluation of the Oceanic Component of PROCFish was undertaken in 2004-2005. Several recommendations of the MTE are pertinent to this project and have been applied in the SCIFISH design.

Regional and global experience has shown that IUU fishing is a threat to conservation and sustainable development of tuna fisheries. Current enforcement strategies focus on the detection of vessels fishing illegally. These enforcement actions are generally uncoordinated regionally, allowing vessels to avoid detection. The unreported and unregulated components of IUU are often neglected due to difficulties in quality of data and analysing techniques.

SCIFISH therefore includes a range of monitoring, control and surveillance (MCS) activities, including pilot studies to trial new satellite-based tools for the detection of IUU fishing in both the ACP and OCT components, harmonisation of MCS data types and formats and developing systems to share data, development of methods to verify fishing effort and catch reports, and undertaking IUU risk assessments in ACPs.

2. DESCRIPTION OF THE ASSIGNMENT

The objectives of the evaluation are to:

1. determine the efficiency, effectiveness and impact of SCIFISH in meeting its objectives and the sustainability of the outcomes ; and
2. ascertain the need for an extension in time and other resources in order to effect a smooth transfer of activities to the WCPFC (and, for some activities, to its member ACP States and OCTs).

Specifically the midterm review will:

(i) Assess the degree to which project activities have achieved the defined goals, objectives and targets of SCIFISH.

(ii) Review the problems faced, lessons learnt and successes achieved which could strengthen institutional capacity and future planning.

(iii) Review and assess the relevance of the original project design, Financing Agreement and ToRs of the Technical Assistance contracts in light of achievements or failures to achieve the expected objectives.

(iv) Conduct cost benefit analysis of the project.

(v) Assess the issue of sustainability.

(vi) Assess the project's sensitivity to environmental and gender issues, specifically whether these issues are addressed.

MAIN ISSUES TO BE STUDIED

When undertaking the evaluation, the Consultant should address the following issues:

Project Design

Assess the project design based on the original Financing Agreement. Also assess the internal coherence of the project with due consideration to:

- The overall objective
- Project purpose
- Results
- Activities
- Assumptions / preconditions
- Comment on the Logical Framework.

Relevance

The consultant will, amongst others, assess the following:

- In what way did the project address regional and national priorities?
- The relevance of the strategies, methodologies and overall approach to address the problems.
- Other interventions of the governments, SPC, EU and other donors which are directly or indirectly related to the project.

More specifically, the Consultant should make an assessment of the contribution of SCIFISH to:

- Fulfilling the data and scientific information needs of the WCPFC and sub-regional tuna fisheries management arrangements administered by FFA; and
- Enhancing the capacity of Pacific ACP States and OCTs to fulfil their scientific data obligations under the WCPF Convention.

Efficiency

Evaluate the efficiency with which the activities of SCIFISH have been undertaken in order to yield project results. The following aspects should be considered:

- Organisation and management, analyses of the organisational arrangements (structures, responsibilities and contractual arrangements) relating to the project (SPC, TA, national ministries, regional organizations, etc.). This includes an assessment of the management capabilities of SPC and the mechanisms put in place to monitor and manage national activities.
- The issues include the plan of operation and timetable, financial management and budgeting, application of Contribution Agreement rules and procedures, terms and conditions, phasing of activities, internal monitoring arrangements, management of TA under the project, coordination with donors and institutional capacities of national ministries.
- Implementation of activities, including the quality, quantity and timing of technical assistance, training and other project outputs at the regional and national levels;
- The monitoring of SCIFISH carried out by SPC, the RAOs and EU Delegation.

Effectiveness

The evaluation will analyse the relationship between the project purpose and results achieved to date. The following questions should assist with the assessment of the effectiveness of the project:

- What are the results obtained so far by the projects activities and who are the beneficiaries (compare actual vs. planned)?
- To what extent has the project purpose been achieved, or can be expected to be achieved in the current project duration?
- Have there been unforeseen beneficiaries or unintended consequences, and if yes, explain why, the extent, impact and implications for all stakeholders?
- Have the assumptions required to translate project results into the project purpose been realised? If not, why and how did this affect the project?
- Have the project resources (TA and personnel, equipment, training, research etc.) been directly related to project results?
- Have appropriately qualified and experienced staff been recruited to implement the project and contribute to planned project outputs.

Impact

The Consultant will analyse the foreseen and unforeseen project impacts, whether they be positive or negative. The Consultant will, if possible, compare the scenario immediately prior to the implementation of the project with the achievements of the project to date.

Based on the results of the project to date, the Consultant will assess the impact and predict the potential impact of SCIFISH in the following areas:

- Impact on scientific understanding of the western tropical Pacific pelagic ecosystem and its constituent species;
- Impact on knowledge of status of stocks of the main target tuna species and the effects of fishing upon them;
- Impact on the quantity, quality and scope of data being collected from regional tuna fisheries;
- Impact on the capacity of ACP States and OCTs to collect and compile data on tuna fisheries under their jurisdiction, consistent with their obligations under the WCPF Convention.

Sustainability

The Consultant will assess the extent to which the activities of SCIFISH at the regional and national levels need to be sustained and whether or not this is likely to occur beyond Year 3 of the project. The evaluation should specifically consider the timing of SCIFISH in relation to the state of development of the WCPFC and the capacity of ACP States and OCTs to meet their obligations to it.

In terms of sustainability particular emphasis should be given to:

Policy Support

Extent to which project has support in the recipient countries.

Degree of agreement on the project purpose Support from relevant organizations (technical, political, business etc.)

Willingness to provide resources (financial and personnel).

Economic and Financial Analysis

This part will be based on a cost effectiveness analysis, and should lead to recommendations aimed at ensuring the sustainability of the project and its results at this level.

Community Acceptance and Ownership

This important component of sustainability needs to be assessed in all relevant target groups. Do the target groups feel the outputs of the project are relevant to their needs?

Appropriate Technology

Does the technology offered correspond to the capacity and needs of the target groups. Will the intended beneficiaries be able to adopt and maintain the technology acquired without further project assistance?

Institutional and Management Capacity

Assess the commitment of all parties involved such as governments, (e.g. through policy and budgetary support) other institutions and potential donors in contributing towards sustainability.

The Consultant should make specific recommendations regarding:

- whether the project needs to be extended in order to effect a smooth transfer of the fishery monitoring and scientific research activities from the project to the WCPFC and its member countries, and if so:
- the duration of the extension and any changes to the current project objectives and activities during this period
- the additional financial resources that would be required to fund any extension that might be recommended

Conclusions and Recommendations

Having evaluated the project in terms of efficiency, effectiveness, impact and sustainability the Consultant will summarise the outcomes and draw conclusions. Additionally the Consultant will identify what policy, organisational and operational lessons are to be learnt by stakeholders, as well as ensure that all substantiated conclusions are followed by corresponding operational recommendations that could be adopted to overcome identified constraints and seize opportunities.

Conclusions should cover all areas of efficiency, effectiveness, impact and sustainability. Each conclusion should lead to a corresponding operational recommendation that could be adopted to overcome constraints. The following points merit particular attention:

i) Overall outcome

What are the main achievements of the project to date and expected? Elaborate on the possible impact of the outcomes and their efficiency, effectiveness and sustainability.

Elaborate also on the remaining needs on the regional and national level and how these would be best met.

ii) Sustainability

Conclusions should be drawn and recommendations made regarding the key sustainability factors relevant to the project. (i.e. is the policy environment likely to ensure the sustainability of the project's benefits) and the conditions and likelihood that these factors will be taken into account of by SPC and/or the States covered by the project.

Management Capabilities

Comment on the efficiency and effectiveness of the organisational and supporting management arrangements.

3. EXPERTS PROFILE

The review will be undertaken by an EU or ACP citizen with a minimum of 10 years experience in tuna fisheries. The Consultant should have expertise in:

- fisheries biology, statistics and stock assessment
- tuna fisheries in the western and central Pacific Ocean
- the data and scientific information requirements of the WCPFC
- the status of fishery monitoring in Pacific ACP States and OCTs
- tuna fisheries management in Small Island Developing States
- project evaluation experience particularly in the framework of PCM and use of logical framework for project management.

The Consultant must be fluent in English, and French. The Consultant must be an ACP/EU national with relevant developing country experience, preferably with some gained in Pacific Island Countries.

4. LOCATION AND DURATION

The evaluation will be undertaken as follows:

- Briefing with the RAO/ACP the EU Delegation, Suva
- Briefing with the RAO/OCT , EU Resident Representative and SPC, Noumea,
- Consultations with SPC/OFP staff and analysis of project documentation at SPC headquarters in Nouméa, and FFA,
- Individual country consultations Solomon Islands and PNG,
- Individual country consultations New Caledonia, French Polynesia,
- De-briefing with RAO/SPC/EU in Suva.

Services rendered between the beginning of the project and the acceptance of the final report should span no more than a period of four calendar months. An indicative time schedule per study phase is as follows:

- Briefings with RAO and EU Delegation, 1 day (Suva)

- Consultations with Fiji Government HoF 2 days
- Briefing with RAO/OCT, EU Representative 1 day and SPC Noumea, and NC Government
- Consultations with SPC/OFP staff and others 4 days
- Consultations with HoF and staff, Noumea 2 days
- Consultations with HoF Solomon Is. and PNG 10 days
- Consultations with HoF French Polynesia 5 days
- De-briefing with RAO/EU/SPC (Suva) 1 day
- Report preparation/finalisation 10 days
- Total days – 36 days including 26 days in the field

5. REPORTING

The Consultant will prepare the following reports:

- A brief end-of-mission note, incorporating the preliminary conclusions of the field mission at the end of field work.
- A draft final report, within one month after the return of the field mission. The final report should include an executive summary, approximately 10% of the text, not more than 5 pages.
- A final evaluation report one month after receiving comments related to the draft report.

NB All reports should be addressed to the RAOs and EU Delegation.

The reports, including synthesis and the summary where appropriate will be transmitted in 20 copies in English and 10 copies translated in French to the RAOs and EU Delegation. Regional, national and Commission authorities will comment upon the draft final report within 30 days of receipt. An electronic copy in MS Word containing the text of the final evaluation reports should also be provided to the RAOs and EU Delegation.

6. ADMINISTRATIVE INFORMATION

n/a

Annex 2: Time schedule for the Review Mission

Day/Date, 2010	Activity
Mon 18 October	Depart UK 22.15on flight BA7312, arrive Sydney 07.05 on Wed 20 Oct.
Wed 20 October	Depart Sydney 17.00 on flight FJ910, arrive Nadi, Fiji 21.30.
Thurs 21 October	Depart Nandi 06.30 on flight FJ03, arrive Suva 07.00. Check into JJ's Hotel, Suva. Meeting with EU Delegation. Meeting with Forum Secretariat.
Fri 22 October	Meeting with Forum Secretariat. Finalisation of in-region travel schedule and purchase of air tickets.
Saturday 23 October	Review of documentation. Preparation of format for mission report.
Sunday 24 October	
Mon 25 October	Discussions via Skype with PNA Secretariat, FSM (Maurice) Meeting with Fiji Fisheries Departmental staff.
Tue 26 October	Depart Suva 05.30 on flight FJ4, arrive Nadi 06.00. Depart Nadi 08.30 on flight FJ261, arrive Honiara, Solomon Islands 11.10. Check into Pacific Casino Hotel. Meetings with FFA management. Meeting with EU Delegation, Honiara.
Wed 27 October	Meetings with Pacific Island Fisheries officials attending FFC Sub-committee meeting on South Pacific Tuna and Billfish. Meetings with SPC technical staff. Meetings with FFA technical staff.
Thu 28 October	Meetings with Pacific Island Fisheries officials attending FFC Sub-committee meeting on South Pacific Tuna and Billfish. Meetings with FFA technical staff.
Fri 29 October	Meetings with Pacific Island Fisheries officials attending PNA Long-line Vessel Day Scheme Technical Working Group meeting.
Sat 30 October	Meetings with Pacific Island Fisheries officials attending PNA Long-line Vessel Day Scheme Technical Working Group meeting. Meetings with FFA technical staff.
Sun 31 October	Meetings with Pacific Island Fisheries officials attending FFC75 Special Meeting.
Mon 1 November	Meetings with Pacific Island Fisheries officials attending FFA Management Options Consultation.
Tue 2 November	Depart Honiara 12.10 on flight IE704, arrive Port Vila, Vanuatu 14.05.

	Meeting with Vanuatu Fisheries Department, Port Vila.
Wed 3 November	Depart Port Vila 10.00 on flight NF64, arrive Noumea 11.35. Check into La Casa Del Sol Hotel. Meeting with EU Delegation. Meetings with SPC Secretariat.
Thu 4 November	Meetings with SPC Secretariat.
Fri 5 November	Meeting with Service de la Marine Mardaude et des Peche Maritimes Meetings with SPC Secretariat.
Sat 6 November	Document review. Report writing.
Sun 7 November	Depart Noumea 08.00 on flight NZ365, arrive Auckland 12.45. Depart Auckland 16.00 on flight NZ4082, arrive Papeete on Saturday 6 Nov at 10.00.
Mon 8 November	Document review, report writing.
Tue 9 November	Meetings with Service de la Peche, Papeete.
Wed 10 November	Meetings with Service de la Peche, Papeete.
Thu 11 November	Document review, report writing.
Fri 12 November	Depart Papeete 01.50 on flight NZ41, arrive Auckland 06.55 on 13 November.
Sat 13 November	Depart Auckland 14.05 on flight FJ410, arrive Nadi, Fiji at 17.10. Depart Nadi 20.20 on flight FJ25, arrive Suva 20.50. Check into Suva Motor Inn.
Sun 14 November	
Mon 15 November	Preparation of summary report.
Tue 16 November	Debriefing at EU Delegation.
Wed 17 November	Depart Suva 06.30 on flight FJ6, arrive Nadi 07.00. Depart Nadi 09.00 on flight FJ911, arrive Sydney 11.25. Depart Sydney 16.25 on flight on flight BA16.
Thu 18 November	Arrive UK 05.25.

Annex 3: List of Persons met

Name	Title/Organisation	Email
Meetings in Fiji, 21-25 October, 2010.		
Bernard Blazkiewicz	Third Secretary: Regional Integration, Natural Resources and Environment, Delegation of the EU for the Pacific, Suva, Fiji.	bernard.blazkiewicz@ec.europa.eu
John Stunnenberg	Senior Technical Adviser (EU), Pacific Islands Forum Secretariat, Suva, Fiji.	johns@forumsec.org.fj
Rosenna Ratuloluai	Technical Adviser (EU), Pacific Islands Forum Secretariat, Suva, Fiji.	rosennar@forumsec.org.fj
Jerry Huekwahin	Technical Adviser to the RAO	jerryhu@forumsec.org.fj
Anare Raiwalui	Principal Fisheries Officer, Management Services, Fisheries Department, Suva, Fiji.	A_raiwalui@yahoo.com
Jone Amoe	Officer in charge of national fisheries database, Suva, Fiji.	fishfinderfj@gmail.com
Robert Gillett	Private Consultant/Tuna Fisheries Management Specialist.	gillett@connect.com.fj
Maurice Brownjohn OBE (via Skype)	Commercial Manager, PNA Office, Majuro.	maurice@pnatuna.com
Andrew Wright (via Skype)	Immediate past Executive Director, WCPFC (previously Deputy Director, FFA)	andrew_wright@ccamlr.org
Meetings in Solomon Islands (delegates attending FFA meetings), 26 October – 2 November, 2010		
Sylvester Okajam	Managing Director NFA, PNG.	spokajam@fisheries.gov.pg
Ludwig Kumoru	Executive Manager, Tuna Fishery, National Fisheries Authority, Papua New Guinea	lkumoru@fisheries.gov.pg
Noan Pakop	Monitoring, Control & Surveillance, PNG (phone?)	npakop@fisheries.gov.pg
Thomas Usu	Tuna Biologist (and main man on tagging field work), PNG (phone?)	tusu@fisheries.gov.pg
Brian Kumasi	Tuna Fisheries Management Officer, National Fisheries Authority, Papua New Guinea	bkumasi@fisheries.gov.pg
Stanley Arua	Fisheries Service Officer, Department of Foreign Affairs and Trade, Papua New Guinea	aruamays@gmail.com
Peter Graham	Director, Policy and Legal Division,	Pita.graham@gmail.com

Name	Title/Organisation	Email
	Ministry of Marine Resources, Cook Islands	
Pamela Maru	Senior Fisheries Officer, Ministry of Marine Resources, Cook Islands	p.maru@mmr.gov.ck
Sanaila Naqali	Director of Fisheries, Ministry of Fisheries and Forests, Fiji	naqali@hotmail.com
Anare Raiwalui	Principal Fisheries Officer, Management Service, Ministry of Fisheries and Forests, Fiji	Anare_raiwalui@yahoo.com
Jone Amoe	Fisheries Officer - Offshore, Ministry of Fisheries and Forests, Fiji	fishfinderfj@gmail.com
Eugene Pangelinan	Acting Exec Director, NORMA, FSM	eugenep@mail.fm
Rhea Moss	Chief of Compliance, NORMA, FSM	rhea.moss@gmail.com
Ms Mbwenea Teioki	Senior Fisheries Officer, Fisheries Department, Kiribati	mbweneat@mfmrd.gov.ki
Ms Aketa Taanga	Senior Fisheries Officer, Fisheries Department, Kiribati	aketat@mfmrd.gov.ki
Charleston Dieye	CEO, Nauru Fisheries and Marine Resources Authority, Nauru	cdeiye@hotmail.com
Terry Amram	Oceanic Manager, Nauru Fisheries and Marine Resources Authority, Nauru	tamramnr@yahoo.com
Dr. Tim Adams	Fisheries Advisor, Nauru Fisheries and Marine Resources Authority, Nauru	tim@dhanjal-adams.com tim.adams@naurugov.nr
Jeremiah Murin	VMS Officer, Nauru	jeremiah.murin@naurugov.nr
Brendon Pasisi	Director, Dept. of Agriculture, Forestry and Fisheries, Niue	fisheries@mail.gov.nu
Kathleen Sisior	Fisheries License and Revenues Officer, Ministry of Natural Resources, Environment and Tourism, Palau	katzpma@palaunet.com
Nannette D. Malsol	Fisheries Law Compliance Officer, Ministry of Natural Resources, Environment and Tourism, Palau	tunapal@palaunet.com

Name	Title/Organisation	Email
Mose Topeto	Senior Fisheries Officer (Oceanic Division), Ministry of Agriculture and Fisheries, Samoa	Mose.topeto@fisheries.gov.ws
Sione Vailala Matoto	Head of Fisheries, Ministry of Agriculture, Food, Forestry and Fisheries, Tonga	svmatoro@tongafish.gov.to
Nikolasi Apinelu	Deputy Director of Fisheries, Ministry of Natural Resources and Environment, Tuvalu	napinelu@gov.tv
Wesley Obed	Principal MCS Officer, Department of Fisheries, Vanuatu	Wes.obed@gmail.com
Tony Taleo	Acting Compliance Officer, Department of Fisheries, Vanuatu	ttaleo@gmail.com
Glen Joseph	Director, Marshall Islands Marine Resources Authority, Marshall Islands	gjoseph@mimra.com
Berry Muller	Chief Fisheries Officer, Marine Resources Authority, Marshall Islands	bmuller@mimra.com
Ferral Lasi	Deputy Director, Offshore Fisheries Management, Ministry of Fisheries and Marine Resources, Solomon Islands	flasi@fisheries.gov.sb
Joseph Atkin Tada	Principal Fisheries Officer (Policy and Planning), Ministry of Fisheries and Marine Resources, Solomon Islands	jatkon@fisheries.gov.sb
Leon Hickie	Deputy Director, Senior Industry Liaison Officer, Ministry of Fisheries and Marine Resources, Solomon Islands	lhickie@fisheries.gov.sb
Noel Taylor-Moore	Fisheries Adviser, Ministry of Fisheries and Marine Resources, Solomon Islands	Ntaylor-moore@fisheries.gov.sb
Nick Davies	Fisheries Scientist, OFP, SPC, Noumea	NickD@spc.int
Shelton Harley	Fisheries Scientist, OFP, SPC, Noumea	SheltonH@spc.int
Graham Pilling	Fisheries Scientist (FFA Liaison), OFP, SPC, Noumea	GrahamP@spc.int
Transform Aqorau	Director, PNA Office, Majuro, Marshall Islands	transform@pnatuna.com

Name	Title/Organisation	Email
Sangaa Clark	Consultant to PNA	sangaa@xtra.co.nz
Ambrose Orianihaa	Observer Placement Officer, FFA.	Ambrose.orianihaa@ffa.int
Frederick Austin	Deputy Observer Placement Officer, FFA	Frederick.austin@ffa.int
Ian Freeman	Fisheries Management Adviser, FFA	Ian.freeman@fa.int
Brian Scott	Database Manager, FFA	Brian.scott@ffa.int
Len Rodwell	Director, Fisheries Development, FFA	Len.rodwell@ffa.int
Les Clark	Consultant to FFA	les@rayfishresearch.com
Ramesh Chand	Manager, FFA Vessel Monitoring System, FFA.	Ramesh.chand@ffa.int
Tim Park	FFA Observer Manager	Tim.park@ffa.int
Wez Norris	Director, Fisheries Management, FFA	Wez.norris@ffa.int
Hugh Walton	Fisheries Development Adviser, FFA	Hugh.walton@ffa.int
Su'a N F Tanielu	Director General, FFA	Dan.sua@ffa.int
Robert Stone	Fisheries Development Adviser, FFA	Robert.stone@ffa.int
Ian Cartwright	Fisheries Consultant (previously Deputy Director of FFA)	thalassa@bigpond.com
Masao Nakada	Tuna Industry Officer	masao.nakada@ffa.int
Juan Carlos Hinojosa	Attache – Social Sectors, EU Delegation to Solomon Islands, Honiara.	Juan-Carlos.Hinojosa-Martinez@ec.europa.eu
Elisabeth Gotschi	Attache – Rural Development, EU Delegation to Solomon Islands, Honiara.	Elisabeth.gotschi@ec.europa.eu
Visit to Fisheries Department, Port Vila, Vanuatu, 2 November, 2010		
Wesley Obed	Principal MCS Officer, Department of Fisheries, Vanuatu	Wes.obed@gmail.com
Lucy Joy	Senior Data Officer, Department of Fisheries, Vanuatu	
Meetings in New Caledonia, 3-5 November 2010:		
Mike Batty	Director, Fisheries Programme	MikeB@spc.int
John Hampton	Chief Scientist, Oceanic Fisheries Programme Manager	JohnH@spc.int
Peter Sharples	Port Sampler/Observer Coordinator, OFP	PeterS@spc.int
Timothy Lawson	Principal Fisheries Scientist, Fisheries	TimL@spc.int

Name	Title/Organisation	Email
	Monitoring, OFP	
Simon Nicol	Principal Fisheries Scientist, Ecosystem Monitoring and Analysis, OFP	SimonN@spc.int
Simon Hoyle	Senior Fisheries Scientist (Stock Assessment), OFP	SimonH@spc.int
Ashley Williams	Fisheries Scientist, Stock Assessment and Modelling, OFP	AsheleyW@spc.int
Mechthild Kronen	Programme Manager for Cooperation, Delegation of the European Commission in New Caledonia.	Mechthild.kronen@ec.euopa.eu
Francisco Javier Ortiz de Zuniga	Charge d'Affaires a.i., Delegation of the European Commission in New Caledonia.	Francisco.ortiz@ec.europa.eu
Visit to Fisheries Department, Noumea, New Caledonia, 5 November.		
Christophe Fonfreund	Service de la Marine Marchande et des Peche Maritimes, Noumea.	
Hugues Gossuin	Tuna Coordinator, Service de la Marine Marchande et des Peche Maritimes, Noumea.	huguesg@scp.int
Meetings in French Polynesia, 8-11 November:		
Stephen Yen Kai Sun	Chief, Service de la Peche, Papeete, French Polynesia.	Stephen.yen-kai-sun@peche.gov.pf
Christophe Misselis	Chief, Fisheries and Aquaculture Programmes	Christophe.misselis@peche.gov.pf
Taiana Raoulx	Observer Controller/ SciFish Coordinator	taianaraoulx@gmail.com

Annex 4: List of Project documents consulted

Scientific papers

A spatial ecosystem and populations dynamics model (SEAPODYM) – modelling of tuna and tuna-like populations. Progress in Oceanography, vol. 78, no.4. Sept 2008. Patrick Lehodey, Inna Senina, Raghu Murtugudde.

Parameter estimation for basin-scale ecosystem-linked population models of large pelagic predators: Application to skipjack tuna. Inna Senina, John Sibert, Patrick Lehodey. Progress in Oceanography 78 (2008) 319–335.

Preliminary forecasts of Pacific bigeye tuna population trends under the A2 IPCC scenario. Progress in Oceanography, (2010), doi:10.1016/j.pocean.2010.04.021. P. Lehodey a, I. Senina, J. Sibert, L. Bopp, B. Calmettes, J. Hampton, R. Murtugudde

Scientific Committee Fourth Regular Session, 10-22 August 2009, Port Vila, Vanuatu. PTTP SUMMARY REPORT: REVIEW PHASE 2 : WCPFC-SC5-2009/ GN-IP-13.

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Annex 5: SciFish Logical Framework

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
Overall Objective: Conservation and sustainable use of oceanic fish resources of the western and central Pacific	Improved regional/national treaties and agreements promoting sustainable harvest of the fishery.	• Treaties and Agreements. • National/Regional Sector Plans. • Regional and National reports and database.	World demand for tuna and related products of the Central and Western Pacific maintained at high levels.
Project Purpose: Improved policy and scientific information for better management of the regional and national oceanic fisheries.	Improved management plans and policy frameworks through enhanced scientific and monitoring information for better management of the fishery.	• Management Plans. • National and Regional reports. • Project reports. • Policy papers	The tuna fishery remains a priority area for management and conservation by regional and national administrations.
Result 1: Enhanced oceanic fisheries monitoring.	1.1 Improvement in the observer and port sampling coverage and quality of data to meet the required regional standards. 1.2 More comprehensive IUU compliance assessments undertaken. 1.3 Improved regional coordination of national databases to track and monitor fisheries data for compliance with management requirements. 1.4 Improve detection of IUU fishing through strengthening existing technologies and trial of new technologies.	• Observer reports & training reports. • Regional and national databases. • MOUs signed. • IUU compliance audits. • FFA and SPC reports. • Evaluation reports. • Stock assessment data and reports.	Appropriate and compatible technologies available to strengthen existing monitoring, control and surveillance infrastructure. Sufficient number of observers available for observer and port sampling missions. Commitment by governments to seriously address IUU fishing. ACO and OCT governments will commit to implementing fishery monitoring methods as recommended by the project. Availability of vessel to be

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
Result 2: Enhanced stock assessments.	2.1 Tagging of tropical tunas using conventional and electronic archival tags. 2.2 Improved assessment on status of tuna stocks by developing more accurate stock assessment models.	• Stock assessment models. • Tagging data. • WCPFC reports. • Publications. • Update SEAPODYM. • Project reports.	chartered for tuna tagging exercise.
Result 3: Enhanced understanding of the pelagic ecosystems.	3.1 Produce better management policies through further development and application of the Spatial Ecosystem and Population Dynamics Model (SEAPODYM). 3.2 More accurate estimates and assessment of impact of exploitation in EEZs.		

Activities:

1.1 Training programmes for scientific observers & port samplers.
1.2 Provide quality control for scientific and port sampling data.
1.3 Develop and trial new technologies for enhancing quality of data and timeliness of data collection.
1.4 Develop harmonised fisheries monitoring systems and data sharing protocols.
1.5 Undertake compliance audits and IUU risk assessments.
1.6 Develop and implement methodologies to verify fisheries data.
1.7 Develop and trial new technologies including satellite based technologies for

Cost Estimate (Euro	**ACP**		**Total**
Technical Assistance	1,080,000	853,000	1,933,000
MCS Activities	480,000	100,000	580,000
Travel	150,000	112,000	337,000
Equipment	134,000	138,000	288,000
Tagging Operations	1,200,000	350,000	1,616,000
Training	90,000	24,000	114,000
Observer & Port Sampling	90,000	714,000	804,000
Data Processing and IT Support	330,000	60,000	390,000
Administration / Audit	129,000	42,000	204,000
Indirect Costs	258,000	157,000	417,000
Contingencies	26,000	30,000	57,000
Evaluation	33,000	30,000	70,000
TOTAL	**4,000,000**	**2,610,000**	**6,610,000**

Availability of technical expertise for long and short term engagement.

New technologies for surveillance and data management affordable.

Commitment from the countries to trial new technologies.

Status of tuna stocks at good levels to undertake scientific work covering targeted species.

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
detection of IUU fishing activities. 2.1 Conduct large-scale conventional and electronic tagging and associated biological studies of tuna. 2.2 Conduct analyses of tagging, biological and fishery oceanographic data to better understand population dynamics, behaviour & biology of tuna. 2.3 Develop models to assess status of targeted tuna stocks and impacts of fishing. 3.1 Develop and enhance models of the pelagic ecosystem supporting targeted oceanic fish stocks. 3.2 Provide scientific advice on ecosystems aspects of fishery management including: i) impacts of environment variability on oceanic fish stocks and fisheries; ii) the effects of fishing on the pelagic ecosystem; and iii) potential benefits and effectiveness of specific ecosystem management measures such as marine protected areas			

Annex 6: Relationship matrix between EDF-funded fisheries projects

Type of Activity	*Accomplishments of Past Projects*	*Current Gaps and Needs*	*Proposed Activities to Address Gaps and Needs*
Fishery Dependent Data Collection	*ProcFish-O:* National observer programmes developed and observers trained *SciFish:* Further observer program development focused on data quality, training standards and certification	*ProcFish-O* mid-term review recommended continued observer training and systems development. Newly implemented management measures (2009) require 100% coverage of purse seine fisheries equating to a need for 300-400 new observers by 2012. Coastal data collection under *ProcFish-C* should be expanded to include readily available market and trade statistics (etc.).	*SciCOFish*: Observer Training and Systems (Activity 1-1) will further develop the programmes and meet new staffing requirements and standards. *SciCOFish*: Secondary (Coastal) Data Collection (Activity 2-3) will capture fisheries data from other sources, such as fishermen interview and market survey data, landings and export volumes, to improve understanding of coastal resource utilization. *ACP Fish 2:* "Research strategies" (TBD)
Fishery Independent Data Collection	*ProcFish-O:* Large-scale Pacific Tuna Tagging Programme (PTTP) implemented *ProcFish-C/COFish:* Baseline invertebrates, finfish and socio-economic data collected and reported in site (65) and country (P-ACPs + 3 OCTs) reports *SciFish:* Implementation of PTTP (tagging) Phase 2	*ProcFish-O* mid-term review recommended further large-scale tuna tagging. There is general consensus that not enough effort has been devoted to coastal resource evaluation in the past, and sustainability of these resources is threatened by over-exploitation.	*SciCOFish*: Validating Models through Tagging (Activity 1-5) will increase the accuracy and predictive power of all the modelling tools (previous and new). *SciCOFish*: Stakeholder Consultation (Activity 2-1) and Field Monitoring Protocols (Activity 2-2) will assess the needs and capabilities of individual P-ACP countries and prioritise at least five specific projects to introduce specific field monitoring techniques to local stakeholders. *ACP Fish 2:* "Research strategies" (TBD)
Data Management	*ProcFish-O*: Regional database augmented with observer, port sampling, biological and catch-effort data *ProcFish-C/COFish:*	Databases need to continue to expand to accommodate more advanced observer programmes and new types of coastal monitoring data.	*SciCOFish*: Integrated Tuna Fisheries Databases (Activity 1-2) will enhance database functionality in 14 P-ACP countries, providing new ways of integrating data and providing tools to assess data quality.

Type of Activity	***Accomplishments of Past Projects***	***Current Gaps and Needs***	***Proposed Activities to Address Gaps and Needs***
	Database developed to hold invertebrates, finfish and socio-economic data	Currently a lack of data management capacity contributes to a poor record of fishing activity reporting by some P-ACPs, as well as difficulties in understanding and identifying IUU fishing activities.	*SciCOFish:* Coastal data collected under Activities 2-2 and 2-3 will be in compatible formats with oceanic data. *ACP Fish 2:* "Knowledge exchange system" (TBD)
Data Analysis and Modelling	*ProcFish-O*: Regional stock assessments of skipjack, yellowfin, bigeye and S. Pacific albacore *ProcFish-O:* Ecological risk assessment methodology developed and preliminary results accepted by WCPFC *ProcFish-C/COFish:* Indicator invertebrate and finfish species identified *SciFish:* Further development of SEAPODYM for fine-scale (national EEZ) assessment and climate change	*ProcFish-O* mid-term review recommended further development of the SEAPODYM model for EEZ-level application. P-ACPs have called for the development of tools and strategies to evaluate national impacts from management measures and mitigate the effects of climate change.	*SciCOFish*: Bio economic modelling (Activity 1-3) will allow estimates of the economic impacts on Pacific P-ACPs of alternative tuna fisheries management measures. *SciCOFish:* Ecosystem modelling (Activity 1-4) will show the impact of measures at the national level, help develop national tuna management plans, and assess impacts due to climate change. *ACP Fish 2:* "Research strategies" (TBD)

Type of Activity	*Accomplishments of Past Projects*	*Current Gaps and Needs*	*Proposed Activities to Address Gaps and Needs*
Public Sector Capacity Building	*ProcFish-O:* Support to MHLC/PrepCon (forerunner to WCPFC) *ProcFish-C/COFish:* Training, manuals, and data analysis workshops for invertebrates, finfish and socio-economic data in 14 P-ACPs + 3 OCTs *DevFish:* Numerous Economic and industry development studies covering most P-ACPs *DevFish:* National Action Plans with improved policies in some countries *DevFish:* Interventions facilitating EU market access in some P-ACPs	The *ProcFish-C* mid-term review noted that the greatest impact on sustainable management of coastal resources will come from country reports and other national inputs. Encouraging local uptake of these recommendations is therefore essential. The *DevFish* mid-term review reported that substantial progress had been made but that the ambitious goals of the project would require a longer-term effort to achieve.	*SciCOFish*: Scientific advice for development of management of coastal resources (Activity 2-4) will develop five new fishery management plans/measures in consultation with local stakeholders. *DevFish2:* Several activities (Fishery Development Strategies (Activity 1-1); Transparency in Systems and Procedures (Activity 1-2); and Technical Assistance to Competent Authorities (Activity 1-3)) will continue the long-term efforts of *DevFish* to advance poverty alleviation, promote regional economic integration, and achieve compliance with international trade rules through public sector capacity building. *ACP Fish 2:* "Sectoral policy development" (TBD) and "Capacity for policy making and management" (TBD)
Private Sector Capacity Building	*DevFish:* Development Action Plans produced or in progress for 3 P-ACPs *DevFish:* Improved private sector participation via industry association strengthening	The *DevFish* mid-term review reported that substantial progress had been made but that the ambitious goals of the project would require a longer-term effort to achieve.	*DevFish2:* Several activities (Training to Industry for Export Expansion (Activity 1-4); Technical Assistance to Fishing Companies (Activity 1-5); and Pilot Projects for New Technologies (Activity 1-6)) will continue the long-term efforts of *DevFish* to advance poverty alleviation, promote regional economic integration, and achieve compliance with international trade rules through private sector capacity building. *ACP Fish 2:* "Supportive framework for private sector" (TBD)
Combating IUU Fishing	*SciFish:* Some monitoring, control and surveillance activities by FFA	Some stakeholders believe that deterrence of IUU fishing activities is a priority.	*SciCOFish:* Observer training (Activity 1-1) and integrated databases (Activity 1-2) will assist in combating IUU fishing activities. *DevFish2:*

Type of Activity	*Accomplishments of Past Projects*	*Current Gaps and Needs*	*Proposed Activities to Address Gaps and Needs*
			Regional Strategy to Combat IUU Fishing (Activity 2-1), Identify and Remedy Technical and Capacity Shortfalls (Activities 2-2), and Integrated Assessment of Enforcement and Fisheries Databases (Activity 2-3) will contribute significantly to detecting and prosecuting IUU fishing operations.

Notes:

PROCFISH OCEANIC - €3.9 m (ACP), €1.0 m (OCT) – 2002-2007:
Scientific support to P-ACPs, P-OCTs and the fledgling WCPFC for the sustainable management of the region's oceanic fisheries resources

PROCFISH COASTAL/ COFISH - €7.6 m – 2001-2009:
Rigorous, comparable information about the status and prospects of reef fisheries, provided for process of developing reef fishery management measures.

DEVFISH - €3 m – 2005-2009:
Support for development of domestic tuna industries

SCIFISH - €4 m (ACP), €2.6 m (OCT) - 2008-2012:
Provide a scientific basis for regional and national oceanic fisheries management decision-making by the WCPFC and by Pacific ACP and OCT Governments

ACP FISH 2 - €30 m of which €1.4 m reserved for Pacific activities – 2009-2014:
Sustainable management of fisheries in all ACP countries

Proposed SCICOFISH - €9 m – 2010-14:
Provide a reliable and improved scientific basis for management and decision making in oceanic and coastal fisheries

Proposed DEVFISH 2 - €8.2 m - ? 4 years:
Development of sustainable domestic tuna industries

Annex 7: Compiled summary of results achieved

The following detailed were extracted from the Annual Progress Reports for 2008 and 2009, and the 6-monthly report (Jan-June 2010).

Result 1: Enhanced Oceanic Fishery Monitoring

1.1 Observer/port sampler training

For the ACP:

- Two national observer training courses for PNG in the month of February and June completed with 22 trainees trained. A third course in PNG (16 trainees) was underway at the time of report preparation.
- Observer training course for Solomon Islands carried out during the month of April. 15 new observers were trained.
- Fiji Observer Refresher Course carried out in August. 9 current observers were trained.
- Assessment of Republic of Marshall Islands Observer training scheduled for January 2009
- Sub-regional course for Micronesia (Federated States of Micronesia and Palau) carried out in July/August. 3 new observers from FSM and 6 from Palau were trained.
- Vanuatu sub-regional basic training course carried out in October (Tuvalu, Kiribati, Vanuatu, Fiji, Tonga and Samoa participation). 14 new observers were trained
- 8th Regional Observer Coordinator's workshop held in Palau during the month of July.
- PNG, Kiribati, FSM, Marshall Islands observer courses completed
- 109 new observers trained for deployment in PIRFO through completion of 8 Observer Training Courses until July 2010 (SB (1), FSM (2),RMI (1), KI (2), PNG (2).
- Mini Observer Coordinators Workshop held 22 - 24 July.

For the OCT:

- National Observer, port sampler and observer coordinator training courses conducted for New Caledonia and French Polynesia. 4 trainees attended.
- French Polynesia 3 observers trained in May 2009, and one former observer has been refreshed. In July 2009, 6 observers, 2 port sampler and 1 coordinator belong to SCIFISH Programme.
- Since commencement of SciFish, FP observers have undertaken 31 observer trips on board domestic longliners (554 days at sea and 375 sets observed). 752 port sampling operations conducted during fish unloading. Sampling coverage averaging 76%. Observers data and port sampling data routinely sent to SPC for entry to regional observer database.
- NC observers trained under SciFish conducted 14 trips on 11 different domestic longliners (163 days at sea, 108 set and 198,494 hooks observed). Observer trips represent coverage of 8% (objective set was 5%). 43 port sampling operations have been conducted during fish unloading. Sampling coverage is 20% (objective was 10%). Reports produced for each trip and shared with vessel skippers and ship owners. Estimates made of shark catch (sold for fins) by the New Caledonian fleet and non- commercial species (rejected at sea).
- Participation of New Caledonia and French Polynesia in observer training as required
- Participation of New Caledonia and French Polynesia observer coordinators in Observer Coordinators Workshop

1.2 Training attachments

For the ACP:

- 2 week attachments by Solomon Islands and Samoa fisheries staff completed. Cook Islands and Vanuatu Samoa planned before the 31 Dec 2008
- Fishery monitoring attachments to SPC : 2 (Vanuatu and Cook Islands)
- Attachments facilitated at OFP, Noumea (generally 2-week duration) for MCS officers from Solomon Islands, Samoa, Cook Islands, Vanuatu, Kiribati, Tuvalu, Tokelau. Participants provided with a broad, comprehensive introduction to the WCPFC fishery, data collection procedures and use of current tuna databases.
- Four attachments to OFP. Two participants from Kiribati and one each from Tuvalu and Tokelau. All offered a broad, but comprehensive introduction to the WCPFC fishery, data collection procedures and the current tuna databases

For the OCT:

- No attachments reported.

1.3 Operational support for observer/port sampler programmes

For the ACP:

- Renewed and extended MOU for Samoa and Tonga (observer and port sampling support).
- Funds were allocated and transferred as agreed both MOUs. Observer and data collection forms/equipment provided to countries
- Review/development of fishery monitoring support MOUs with ACPs : Cook Islands, Samoa
- Provision of operational support as per MOUs – Kiribati.
- MOU's established for operational support with PICs and OCTs.
- Funds were allocated and transferred as agreed both MOUs. Observer and data collection forms/equipment provided to countries.
- MOU to support the collection of artisanal tuna data established with Kiribati.
- MOU to support the position of the NTDC in Tuvalu for a further six months
- Purchase and installation of new network servers in Palau, Kiribati, Nauru and Tuvalu.
- Observer and data collection forms/equipment provided

For the OCT:

- **French Polynesia:**
- SciFish support for national Observer Programme commenced April 2008 with 2 observers, 2 port samplers and 1 coordinator.. One observer left the programme in August 2008. Training was conducted in October 2008 and 2 more observers recruited.
- Trained observers established on domestic longliners (coverage of 2.8% of fishing days) with a target observer coverage of 10%. Port sampling operations conducted during unloading with 72%.
- Observers' data routinely sent to SPC to be entered into the regional observer database.
- The French Polynesia Observer/Port Sampling Programme has fully participated in tagging activities under SciFish.
- Three French Polynesia observers trained in May 2009, and one observer received refresher training. One observer left in November 2009. In June 2010, the coordinator resigned. A replacement was appointed. As of July 2010, 5 observers, 2 port sampler and 1 coordinator are supported under SCIFISH.
- Since commencement, 88 observer trips (24 in 2010) have been conducted on board domestic longliners (1398 days at sea and 841 sets observed). Coverage: 5% (% days at sea)

- 1,321 port sampling operations have been conducted during fish unloading (182 in 2010). Sampling coverage was 75%. All observers data and port data have been sent to SPC to be entered to the observer database.

- **New Caledonia:**
- SciFish support for national Observer Programme commenced June 2008 with the appointment of an Observer Coordinator. Trained observers placed on board domestic longliners (coverage of 10% of fishing days), with a target of 5%. Port sampling operations conducted during unloading with coverage of 42% (target 10%). All observer and port sampler data are routinely entered into TUFMAN database. In addition, a mini report is produced using Excel and given to vessel skippers and ship owners.- Data has been used to estimate shark catch (sold for fins) by the Caledonian fleet and estimate of non-commercial species catch and rejections at sea
- 2 observers conducted 16 trips on 12 different domestic longliners (200 days at sea, 130 set and 242 437 hooks observed).
- 77 port sampling operations have been conducted during fish unloading. A new sampler has been recruited totalling 2 in Noumea and 2 in Koumac
- Observer trips represent coverage of 10.3% (Objective was 5%). Port Sampling coverage is 42.5% (Objective was 10%).
- Reports have been produced for each trip and given to fishers and ship owners.
- Data has been used to estimate shark catch (sold for fins) by the Caledonian fleet and estimate of non-commercial species catch and rejections at sea

1.4 Quality control of observer/port sampling data

For the ACP:

- Endorsement of the Pacific Island Regional Fisheries Observer Programme (PIRFO) standards (CBT) by FFC 67. These standards subsequently trialled through the various observer training courses, and 2009 and available online.[12]
- Observer De-briefer workshops held.
- Development of under-pinning knowledge tools for Pacific Island Regional Observer (PIRFO) Competency-Based Observer Training (CBT); - Observer debriefing and debriefing training for Observer Coordinators conducted ; - De-briefer certification workshop ; - Development of Observer trainers in CBT dept. work : Task completed in 2009 and available online http://www.spc.int/oceanfish/Html/Statistics/Observer/PIRFO/index.htm
- Observer De-briefer workshop held 15-21 July. 3 trainee trainers attended each of 6 courses. 2 PNG Nationally run courses with oversight from SPC observer coordinator

For the OCT:

- Development of French version of CBT documentation - Observer debriefing and debriefing training conducted : French version currently being translated and will be available online in late 2010.
- English version of CBT documentation translated into French and made available to the OCTs.

1.5 Development and trials of new technologies for enhancing quality of data and timeliness of data collection

For the ACP:

- Assessment of spill sampling methodology for at-sea observers – target of 50 trial observer cruises by end 2010: Trial the use of data loggers on selected observer cruises[13] :

[12] http://www.spc.int/oceanfish/Html/Statistics/Observer/PIRFO/index.htm

1.6 Development of harmonized fisheries monitoring/data sharing protocols

- Develop harmonised fisheries monitoring / data sharing protocols (FFA): completed in 2009.

1.7 Undertake compliance audits and IUU Risk Assessments (FFA)

For the ACP:

- Resources provided to FFA as per SCIFISH contractual arrangements and tasks scheduled for completion in year 2 of the project.
- IUU Assessments undertaken for 8 ACPs. Resources been provided to FFA as per SciFish contractual arrangements. IUU assessments provided as one component of regional MCS Strategy paper, commissioned by FFA.[14]

For the OCT:

- No report.

1.8 Develop and implement methodologies to verify fisheries data (SPC + FFA)

For the ACP:

- On-vessel spill sampling methodology trials undertaken to remove bias associated with observer length measurement data.
- Development of TUFMAN computer package to generate exception reports by comparing log-sheet, VMS and unloading data.
- TUFMAN Developed from version 4.45 to 4.46 with beta testing on version 5.0 Implementation in Cook Islands Fiji, FSM, Kiribati, Marshalls Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu.
- TUFMAN software documentation developed TUFMAN from version 4.45 to 4.46 with beta testing on version 5.0. Implemented in Cook Islands Fiji, FSM, Kiribati, Marshalls Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu.
- TUFMAN developed to include exception reports using log-sheet and VMS and log-sheet and unloading. TUFMAN version 5.04 released to FSM and Niue. Four installations of TUFMAN v6.00 and v6.02 (Niue, Marshall Islands, Solomons and Nauru) completed.

For the OCT:

- No report.

1.9 Develop and trial new technologies, including satellite-based technologies for the detection of IUU fishing activities

For the ACP:

- Resources provided to FFA as per SciFish contractual arrangements. Completion of tasks expected in year 2 of the project (2009).

For the OCT:

- VMS Pilot study prepared to undertake this work in New Caledonia. CLS contracted. What was result?

Result 2: Enhanced Fish Stock Assessments

2.1 Large-scale conventional and electronic tagging/ biological studies

[13] See see ST-WP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee

[14] Safeguarding the Stocks: A report on analytical projects to support the development of a Regional MCS Strategy for Pacific oceanic fisheries. MRAG Asia-Pacific, 14 Sept 2009.

For the ACP:

- 4-week cruise was completed in the Solomon Islands EEZ in 2008. 17,037 fish were tagged with conventional external dart tags, of which 6,207 skipjack (36.4%); 10,431 yellowfin (61.3%); and 387 bigeye, (2.3%). Archival tagging comprised 11 yellowfin 63-81cm with MK9 tags, and one bigeye (60cm) with a single LTD 2310 tag.
- A second 2 weeks cruise was also conducted and funded under SciFish in the Solomon Islands EEZ to trial a new larger vessel, the Soltai 105, to assess its suitability for the Phase 2 activities of the Pacific Tuna Tagging Programme (PTTP) throughout the wider western and central Pacific. Vessel trial proved highly successful. An additional 12,944 fish were conventionally tagged during this trial.
- An Operational Plan for the regional tag-release programme in 2008 was drafted and endorsed by SCIFISH Project Steering Committee and PTTP Steering Committee[15].
- Preparations were completed for regional tagging preparation (vessel charter, equipment purchase, fishing approvals obtained, short-term staff agreements finalized, and logistics planned.
- *Regional Tagging Cruise no. 1(Western Pacific)* (5 months duration) commenced in June 2008. Tagging was carried out in Federated States of Micronesia (11,721), Palau (7,285), Philippines (1,914), Indonesia (25,197) and Papua New Guinea (10550). The total tag releases for WTP cruise 1 to more than 56,680. Releases also included the deployment of an additional 24 small and 25 large sized electronic tags.
- Tag recovery officer appointed (Mr Brian Kumasi) and Pacific-wide recovery procedures implemented.
- Tag lotteries in association with Infofish Tuna 2008 conference in Bangkok and in Papua New Guinea (Madang and Wewak) completed. Further lotteries are planned for Lae (PNG, 2 December) and Solomon Islands (Noro, 28 November to coincide with the return to home port of the tagging vessel). Specific visits to promote and facilitate tag recovery undertaken in the Thailand, Solomon Islands, Palau, Marshall Islands, Indonesia, Philippines and Papua New Guinea.
- Recovery arrangements have been formalized for Indonesia (4 agents). Data processing activities commenced. Recovery issues documented[16] in and the results of PTTP Phase 1 reviewed[17]. Preliminary analysis on electronic tagging completed and accepted for publication[18] Preliminary analysis of horizontal movement completed February 2009.
- *Regional Tagging Cruise no. 2(Western Pacific)* completed. A total of 51,078 tuna tagged in EEZ of South East PNG, East FSM, Marshalls, Kiribati (Gilberts), Tuvalu and South East Solomon. A total of 176 tuna tagged with archival tags[19].
- *Regional Tagging Cruise no. 3 (Central Pacific)* completed. A total of 2699 tuna tagged on the TAO buoy along 155W and 140W longitude. A total of 90 tuna tagged with archival tags[20].
- Specific visits to promote and facilitate tag recovery undertaken in the Korea, Federated States of Micronesia, Solomon Islands, Palau, Marshall Islands, Indonesia, Philippines and Papua New Guinea, American Samoa.[21]
- Operational plans for 2010 completed.[22]

[15] www.wcpfc.int – SC4, Information Paper no. 4.

16 http://www.wcpfc.int/sc4/pdf/SC4-GNIP5% 20[PTTP%20Tag%20Recovery%20issues].pdf

[17] www.wcpfc.int - SC4, Information Paper no. 3.

[18] Leroy et al. 2008 in Reviews: Methods and Technologies in Fish Biology and Fisheries.

[19] Leroy, 2009, WCPFC-SC5, GN-IP

[20] Schaefer, 2009, WCPFC SC-5, GN-IP

[21] See Duty Travel Reports Kumasi (13/5/09) Nicol (29/5/09) Williams (2/6/09) Nicol (10/7/09).

[22] see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

- *Regional Tagging Cruise no. 4 (Central Pacific)* completed.[23]
- 60 tag seeding kits deployed.[24]
- Tag recovery work conducted, and will proceed for many years.[25]
- Operational plans for 2010 completed[26]
- Western Pacific tagging cruise #4 postponed to 2010 due to insufficient funds.
- Central Pacific Cruise 4 completed[27].
- 60 tag seeding kits deployed.[28]
- Tag recovery proceeding.[29]

For the OCT:

- Albacore biologist appointed and commenced in May 2008.
- Feasibility study and operational plan for albacore tagging drafted and presented to SCIFISH Steering Committee meeting. Study examined the possibility of albacore tagging in the PNG pump boat fishery, to assess whether caught fish were sufficiently healthy for tagging, and found that the PNG pump boat fishery is not cost effective.
- Planning and preparation for subtropical albacore tagging (NZ, eastern subtropical convergence zone) completed. New Zealand tagging cruise scheduled for February and March 2009. Contract awarded for tagging vessel. Tag recovery arrangements made in New Zealand and American Samoa. Australian arrangements established through CSIRO. Recovery arrangements organized in New Caledonia, French Polynesia, Samoa, Fiji, Vanuatu and Cook Islands.
- Sampling design established for age/growth, reproductive biology and vertical habitat utilization studies. Agreement reached with CSIRO to develop collaborative timeline and sampling regime between CSIRO East Australian Zone albacore study and broader SciFish-funded albacore study.
- Albacore sampling programmes, data processing commenced Dec 2008.
- Preliminary analysis of albacore otoliths microchemistry undertaken to assess feasibility of further more extensive trial to assess large-scale movement dynamics. The outcomes from this analysis indicated potential for this approach to collect information of larger movements. A more extensive trials planned for February – March 2009.
- *Albacore tagging cruise one* completed. Overall, a total of 2766 albacore were tagged and released with 1,457 of these fish also receiving an injection of oxytetracycline (OTC) for age validation experiments.[30]
- Collection of otoliths and gonads from albacore undertaken. A total of 202 albacore sampled. Procedures for analysis and collaboration established with CSIRO in Australia. [31]
- *Albacore tagging cruise 2* completed (NZ).
- *Albacore tagging cruise 3* completed (Tonga/Fiji).
- Albacore data processing conducted, tag recovery procedures implemented and biological sampling training implemented. Albacore tagging completed.[32]

[23] For results see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[24] For results see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[25] see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular- session-scientific-committee.

[26] see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[27] For results see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee

[28] For results see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[29] see GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[30] Williams, 2009, WCPFC-SC5, GN-IP.

[31] Farley et al, 2009, WCPFC-SC5 B1-WP.

[32] See GN-IP-06 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

2.2 Analysis of tagging, biological and fishery oceanographic data

For the ACP:

- Biological parameters and spawning biomass calculations for yellowfin tuna in the WCPO have been adjusted.33
- Analysis of vertical movements undertaken. 34
- Analysis of horizontal movements undertaken. 35
- Summary of PTTP Phase 2 reviewed.36
- Preliminary stock assessment models for south Pacific albacore, yellowfin, and bigeye drafted for 2009.37
- Preliminary data analysis on horizontal movement and exploitation completed.38
- Preliminary data analysis on FAD effect completed39.
- Activities commenced. Recovery issues documented40 and the results of PTTP Phase 1 reviewed[41.]
- Preliminary analysis on electronic tagging completed and accepted for publication[42.]

For the OCT

- Standardized CPUE for distant–water fleets targeting south Pacific albacore. [43]
- Analysis of population reproductive & growth of albacore[44] -
- Data analyses commenced, preliminary results reported to WPFC-SC6.[45]
- Tagging reports completed for New Caledonia and French Polynesia.

2.3 Incorporation of data/analytical results into stock assessment models.

For the ACP:

- PTTP data included in 2010 skipjack stock assessment.[46]
- PTTP data included in 2010 skipjack stock assessment. see GN-WP-10 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee

For the OCT

- Albacore reproductive ogive and growth curves estimated[47]

[33] Hoyle et al 2009, WCPF-SC5, BI-WP.

[34] Leroy et al 2009, ICES Proceedings.

[35] Royer et al, 2009. Preliminary report to SPC.

[36] Leroy et al 2009. WCPFC –SC5, GN-IP.

[37] Langley et al 2009 WCPFC SC5-SA-WP Harley et al 2009 WCPFC-SC5-SA-WP Hoyle & Davies 2009 WCPFC-SC5-SA-WP

[38] See GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee

[39] See GN-IP-04 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[40] http://www.wcpfc.int/sc4/pdf/SC4-GNIP5% 20[PTTP%20Tag%20Recovery%20issues].pdf

[41] http://www.wcpfc.int/sc4/pdf/SC4-GNIP3% 20[Review%20PTTP%20Phase%201].pdf

[42] Leroy et al. 2008, in Reviews: Methods and Technologies in Fish Biology and Fisheries.

[43] Bigelow et al, 2009, WCPFC-SC5 SA-WP.

[44] See GN-IP-06 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[45] See BI-WP-01 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[46] See GN-WP-10 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

Result 3: Enhanced Understanding of the Pelagic Ecosystem

3.1 Ecosystem model development and enhancement

For the ACP:

- Collecte Localization Satellite (CLS), based in Toulouse, France, contracted. Ecosystem modeller position at SPC recruited.
- Technical documentation of revised SEAPODYM Model completed. Optimisation documented in Senina *et al*. in press, Progress in Oceanography, and general developments documented[48].
- Parameterisation and initial simulations completed for skipjack (Senina et al. 2008, Progress in Oceanography) and bigeye Lehodey *et al*. 2008, *Progress in Oceanography*. Catch and length data prepared for yellowfin and parameterization of yellowfin model completed.
- Applications of Seapodym to south pacific albacore, yellowfin and climate change forecasting.[49]
- Mixed resolution forcing data sets compiled for SPC member countries.
- Incorporation of multiple cohort tagging data into SEAPODYM.
- MSY extraction code developed for SEAPODYM.
- Seapodym Mixed resolution models for PNG and Kiribati completed. [50]

For the OCT:

- Parameterised SEAPODYM model completed for South Pacific albacore.
- Fisheries Oceanographer appointed.
- Initial albacore model parameterized.
- CPUE and length frequency data recompiled for final parameterization.
- Fine resolution grid of oceanographic data generated for New Caledonia EEZ to trial mixed resolution version.
- Report documenting South Pacific albacore SEAPODYM model.[51]
- Seapodym Mixed resolution models for NC and PF.[52]

3.2 Use of models for research/ management applications

For the ACP:

- Evaluation of time-area closures for tropical tuna management
- Reports on EEZ-scale evaluations of tuna fisheries for selected ACPs using SEAPODYM model produced.[53]

For the OCT:

- Application of SEAPODYM to South Pacific albacore in the New Caledonia EEZ. [54]
- Report documenting EEZ scale oceanographic effects evaluated in the context of current South Pacific albacore fisheries management.[55]

[47] See BI-WP-01 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[48] www.wcpfc.int, SC-4, Working Paper 10.

[49] Lehodey et al 2009 WCPFC-SC5-EB-WP

[50] See EB-IP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[51] Seapodym Mixed resolution models for NC and PF See EB-IP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[52] See EB-IP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[53] See EB-IP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.

[54] Briand et al 2009 WCPFC-SC5-EB-WP

[55] See EB-IP-02 at http://www.wcpfc.int/meetings/2010/6th-regular-session-scientific-committee.