

Secretariat of the Pacific Community

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## **Increasing Pacific Island participation in oceanic fisheries stock assessment**

Oceanic Fisheries Programme  
Secretariat of the Pacific Community  
Noumea, New Caledonia

[www.spc.int/oceanfish](http://www.spc.int/oceanfish)



## Increasing Pacific Island participation in oceanic fisheries stock assessment

### Purpose

1. The purpose of this paper is to:
  - Respond to the concerns raised during previous HoFs, and through the 2009 independent review of the SPC Marine Resources Division, on the lack of Pacific Islanders involved in the stock assessment of oceanic fisheries resources;
  - Inform HoFs that due to the freezing of a key position in 2011, OFP has been forced to cancel and/or postpone major capacity building exercises in 2012;
  - Present several modes for the delivery of capacity building in this area; and
  - Seek your endorsement of a four-year project proposal, to be provided to CRGA and potential donors, that seeks to: 1) increase the level of understanding among Pacific Island fisheries officers of regional stock assessments; and 2) provide a pathway for those Pacific Island fisheries officers who wish to pursue a career in stock assessment.

### Introduction

2. The lack of Pacific Islander involvement in oceanic fisheries stock assessments is a concern that has been raised at previous Heads of Fisheries meetings and noted in the 2006 Marine Resources Division independent review; it is also a concern shared by staff in the Oceanic Fisheries Programme.
3. To help address this issue, OFP began by developing workshops to train PICT fisheries officers in how to understand and interpret the results from regional stock assessments. These workshops were built upon with short-term attachments at SPC, where OFP staff worked together with PICT fisheries officers on issues of national interest. These interactive educational opportunities were a necessary step to promote the development of stock assessment capacity within PICTs.
4. Unfortunately in 2011, SPC had an unexpected reduction in programme funding, which resulted in the loss of one of two National Fisheries Scientist positions (whose responsibilities included stock assessment capacity building programmes). The reduction in resources made it necessary to cancel the 2012 stock assessment workshops and has caused delays in scheduling of short-term attachments.
5. This paper describes a proposal to implement educational programmes to increase PICT fisheries officers' understanding of regional stock assessments and increase their participation in the development of complex quantitative stock assessments.<sup>1</sup> The proposal involves the re-establishment of the National Scientist position with a specific focus on capacity building activities and the inclusion of resources for monitoring and evaluation to allow the tracking of trainees and to coordinate communication with the various donor agencies that might be expected to fund this proposal. We specify several modes for the delivery of capacity building (see Annex I for a summary of proposed activities).

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<sup>1</sup> This proposal does not cover the training workshops and attachments that relate to data collection and management undertaken by the two data-related sections in OFP, which currently have adequate resourcing.

6. The remainder of this paper summarises the proposed modes of delivery for capacity building, indicates the likely level of budget support necessary to implement these initiatives, identifies the intended outcomes and identifies some risks to achieving these.

### Stock assessment training workshops

7. The stock assessment workshops began in 2006 and have utilised a wide range of funding sources over time. The workshops aim to *'increase the ability of PICT fisheries officers to: 1) understand the regional stock assessments and interpret and communicate these to PICT fisheries managers; and 2) participate meaningfully and fully in the Commission and its associated Scientific Committee meetings'*.
8. The workshops have been very successful in achieving these aims. For example, past participants of these workshops now hold formal roles (e.g. convener) within the WCPFC Scientific Committee or have gone on to pursue further studies. The workshops have become so popular that many PICTs – and even some non-SPC members – have obtained their own funding to allow their fisheries officers to attend. These workshops are not intended to provide training in how to undertake the assessment itself.
9. These workshops are of value to both those PICT fisheries officers with an interest in undertaking further work in stock assessment and those who may be more interested in a career in fisheries management or compliance, but would like to have a general understanding of the regional stock assessments.
10. Two workshops have been developed, with one covering the basic principles behind stock assessment and the second focused on the more advanced features of the regional assessments (e.g. key assumptions and weaknesses). The performance of each participant was monitored with marked assignments and, in some years, exercises were provided online for participants to refresh their knowledge throughout the year. Workshops have previously been scheduled a few weeks prior to the WCPFC Scientific Committee meeting so as to facilitate the participation of member countries in that forum.
11. Two problems were encountered in the delivery of these workshops: 1) Funding sources: Often, several sources of funding were necessary to support all SPC members. Considerable human resources were often spent on proposals to secure funds and on post-workshop reporting to funders. 2) Workshop material development: while significant resources were required to update the workshop material each year to reflect the most recent stock assessments, there was often less time available to focus on how material was to be presented.
12. Unfortunately, the freezing of one of the National Scientist positions since mid-2011 has meant that it was not possible to hold these workshops in 2012. If this proposal is successfully funded, the following approach is proposed:
  - Workshops will be overseen by the National Fisheries Scientist (Capacity Building), with considerable input from the other national scientist position and other OFP staff;
  - Consulting funds will be used to bring in a teaching specialist to assist in the redevelopment of the workshop material and structure; and
  - In coordination with a website consultant, Web-based approaches will be developed for exercises throughout the year.

## Data analysis training workshops

13. Whilst the stock assessment workshops are mostly based around building an understanding of stock assessments, the data analysis training workshops will provide opportunities for more hands-on development of new skills and techniques.
14. It is critical that participants in the data analysis workshops have opportunities in their work environment to exercise these new skills regularly. Therefore, these workshops should be restricted to officers from those PICTs with an interest in further work in stock assessment, not those that are more interested in other aspects of fisheries.
15. It is anticipated that these workshops will be delivered primarily by outside statistical consultants (e.g. university faculty), but will use examples relevant to regional oceanic fisheries resources. The main software tool used by participants would be the software R. This is the most widely used statistical software in the world; it is used on a daily basis by all stock assessment and modelling scientists within OFP and is free.<sup>2</sup>
16. We propose to pre-screen interested individuals to ensure that the workshop material can be pitched at the appropriate level. Depending on demand, we envisage workshops covering the following areas: a) introductory statistics; b) analysis of fisheries data (e.g. linear models); and c) introductory stock assessment (unlikely before year 3). Exercises would be developed for completion throughout the year.

## Short-term attachments

17. These attachments were historically aligned with the development of National Tuna Fisheries Status Reports and involved a PICT fisheries officer coming to SPC to work closely with OFP scientists on some aspect of these reports. Under the current model of national work, there is scope to work on any small issue of national significance that can be completed within the scope of the attachment.
18. The short time frame does not provide much scope for the learning of new concepts or approaches (e.g. new software packages), but it does provide an opportunity for the PICT fisheries officer to exercise his or her skill set and get one-on-one feedback in a collaborative work environment. This promotes relationship building and development of greater confidence in communicating and discussing scientific issues. As with the stock assessment workshops, these attachments build analytical/scientific capacity regardless of whether the fisheries officer has longer-term aspirations to be involved in quantitative fisheries data analysis.

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<sup>2</sup> [www.r-project.org](http://www.r-project.org)

## Long-term attachments

19. Skills are best developed when you have an opportunity to apply them frequently. In contrast to short-term attachments, long-term attachments (e.g. six months) provide the basis to establish new skills. These longer attachments should be restricted to officers from those PICTs with an interest in further work in stock assessment, rather than those that are more interested in other aspects of fisheries. Due to the longer time frames, officers on long-term attachments can expect to work on larger projects, most likely of regional significance, and to learn and use the same software tools used in OFP. The output of the attachment would most likely be either a scientific manuscript or a paper submitted to the WCPFC Scientific Committee.
20. These Pacific Islanders are drawn from at least two sources:
  - Existing fishery staff who are released<sup>3</sup> from their roles for six months; or
  - Recent graduates from either graduate or post-graduate study getting some specific training before heading on [hopefully] to a role with their national fisheries department or a regional agency.

## Support for post-graduate study

21. Specific skills in stock assessment and data analysis can be initiated during the various workshops and attachments proposed above, but a comprehensive post-graduate study programme is the best way to develop the skills at the level required to work full-time in this area.<sup>4</sup> Post-graduate study provides an opportunity to be immersed in learning new skills and techniques with a mixture of course work, research, and, importantly, other students to work with and learn from. It represents a huge commitment, both personally and financially, but has the potential to produce long-term benefits to the region.
22. Qualified Pacific Islanders have opportunities to apply for scholarships through many bilateral programmes from other donor countries. In our experience, good post-graduate students can easily find funding for particular fisheries projects, i.e. potential supervisors typically have funds and projects available and are actively seeking these graduate students.
23. We do not propose that SPC has a direct role in seeking funds for post-graduate study; rather we propose that SPC provide the following support:
  - Recommendations for particular schools and advisors who might be a good match;
  - Informal or formal advisory roles on supervising committees; and
  - Travel funds for study visits to SPC.
24. In our experience, it is invaluable to have links to people actively working in the field while pursuing post-graduate study. It provides feedback on the research area – allowing it to be kept ‘relevant’ to current regional needs. It also provides professional links which prove useful once studies conclude. Further, providing and maintaining professional links to the region is critical, as quantitative fisheries graduates are in extremely high demand globally!

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<sup>3</sup> Consideration required as to whether these are paid appointments to SPC with national staff taking leave of absence, or attachments to SPC where the staff are paid from home and we only cover DSA etc.

<sup>4</sup> Stock assessment staff at OFP have either PhDs in stock assessment or Masters degrees and many (5+) years of professional experience.

## Intended outcomes

25. The primary goals of the proposed activities are two-fold: to *'increase the participation of Pacific Islanders in the quantitative assessment of oceanic fisheries resources'*, and to *'raise the level of understanding of stock assessment and data analysis among those not actively working in this area'*. Indicators that could be assessed at the end of the project could include:<sup>5</sup>

- Number of participants in formal roles within the WCPFC Scientific Committee
- Number of participants working in analytical positions within national governments (not only restricted to fisheries)
- Number of participants engaged in graduate or post-graduate studies
- Number of participants working in stock assessment and data analysis with OFP

26. In order to monitor and evaluate the impact of the proposed capacity building activities, we propose that specific resources be allocated to this area. The key tasks would be to a) collect detailed information on all participants; b) annually track their career paths; and c) conduct interviews with all participants to determine the value of the training and its role in their career choices. This task would also involve proposal writing and reporting associated with the project. Gender disaggregated statistics would be collected through this work.

## Risks to achieving outcomes

27. For this proposed capacity building programme to achieve its objectives, there needs to be buy-in, not only from the participants, but also from their home fisheries departments. The table below outlines the greatest risks we see to this project and some potential solutions.

Risk area	Issue	Risk mitigation
No opportunity to participate	Fisheries departments are typically small, with most staff having multiple responsibilities. The appropriate staff may not get released for training activities.	Seek buy-in for the project concept through Heads of Fisheries and CRGA.
No opportunity to exercise skills	As above, the opportunities for scientific analysis and use of the skills learned could be limited.	Provide online refresher activities that participants can complete from home to keep skills honed.
Change of career path	Young people often change jobs and careers.	Having capacity building programmes to participate in should provide an incentive to stay in fisheries.
Trained staff move away (from home or fisheries)	Qualified fisheries stock assessment scientists are in high demand globally and their quantitative skills will make them attractive to other government departments or the private sector.	As the value of fisheries resources is increased, opportunities for more fully scientific roles should increase with the hope that funding for fisheries positions can be competitive.

<sup>5</sup> Note that many of these outcomes are likely to be over longer time frames than four years.

28. Through our proposed monitoring and evaluation activities we will stay in close contact with all training participants and WCPFC Scientific Committee delegates (if not involved in training) throughout the project. This will provide the basis for evaluating how various factors contribute to the success of the project.

## **Budget**

29. A four-year budget for the proposed activities is provided as Annex II and a summary of the total budget is provided below. The total budget that covers all staff time, participant costs, consultancies and equipment is 1.88 million CFP units over four years (or 2 million AUD). Some support for short-term attachments is already available under the Scientific Support for the Management of Coastal and Oceanic Fisheries in the Pacific Islands Region (SciCOFish) project for 2012–2013.

<b>Item</b>	<b>CFP units</b>
SPC staff	570,000
Stock assessment workshops	393,000
Data analysis workshops	296,000
Short-term attachments	80,000
Long-term attachments	360,000
Study visits	40,000
Equipment	17,500
<i>Subtotal</i>	<i>1,756,500</i>
SPC project management fee @ 7%	122,955
<b>TOTAL</b>	<b>1,879,455</b>
<b>Annual average</b>	<b>469,864</b>

30. We do not currently have any particular donor source in mind for this proposal, but there is scope to link it to currently emerging issues such as the application of the precautionary approach to fisheries (e.g. reference points) and climate change. While it is desirable to have such a project funded from a single source, it is likely that multiple sources would be needed – this would increase the cost associated with reporting from that listed above.

## **Conclusions**

31. Heads of Fisheries are invited to:

- Reiterate the importance and high priority assigned to capacity building and training in the area of oceanic fisheries stock assessment;
- Note that the loss of the programme-funded National Scientist position has required OFP to cancel the 2012 stock assessment training workshops and postpone planned short-term training attachments;
- Recommend that SPC seek support to fund the proposed activities; and
- Provide guidance to SPC on prioritising activities if full funding cannot be obtained.



## Annex I: Summary of capacity building modalities

Mode	Objective	Annual volume	Resource requirements
Stock assessment training workshops	<p>To improve understanding of stock assessment concepts and interpretation of model results.</p> <p>To enable PICT fisheries officers to ask the right scientific questions and integrate regional stock assessment results into national fishery management processes.</p>	Two one-week workshops of 10 participants each.	<ul style="list-style-type: none"> <li>- Travel and daily subsistence allowance (DSA) for participants</li> <li>- Two staff to deliver the material</li> <li>- Consultancy to update material to for current teaching methods</li> <li>- Consultancy to support web development for online exercises</li> <li>- Administrative support for seeking donor funds, arranging travel, and subsequent donor reporting</li> </ul>
Data analysis training workshops	To provide a basic level of statistical knowledge and practice using commonly used statistical packages to enable those PICT fisheries officers with a genuine interest to undertake statistical analyses of fisheries data.	One or two short (2–3 day) workshops each year for 6–8 participants.	<ul style="list-style-type: none"> <li>- Travel and DSA for participants</li> <li>- Consultancy for the workshop delivery</li> <li>- One staff member to work with consultant to help develop workshop material (e.g. examples) that is specifically relevant to participants</li> </ul>
Short-term attachments	To gain an understanding of the thought and technical steps taken to analyse a particular issue. The focus is on the research approach and writing. It would rely on the analytical tools available to the attaché - too short to develop skills with new tools.	Three two-week attachments.	<ul style="list-style-type: none"> <li>- Travel and DSA for participants</li> <li>- One staff member to work with participants</li> </ul>
Long-term attachments	To learn new analytical or stock assessment techniques through working on a large-scale (regional) analysis.	Two six-month attachments.	<ul style="list-style-type: none"> <li>- Costs for participants – travel, salary?</li> <li>- One staff member to work with participants</li> </ul>

**Annex I: Summary of capacity building modalities (continued)**

Mode	Objective	Annual volume	Resource requirements
Advisory support for graduate students	<p>Graduate study offers the best opportunity to learn and develop new analytical and assessment skills; in particular it offers a sustained period to apply these techniques.</p> <p>The objective of OFP's involvement would be to provide advice and introductions to help identify the best programmes for graduate study and then have a formal or informal role in advising the student throughout the programme.</p>	Two students per year, but could be combined with short-term or long-term attachments above.	<ul style="list-style-type: none"> <li>- Prospective students would be responsible for applying for funding and SPC would help where appropriate</li> <li>- Funding would be available for study visits to SPC</li> <li>- Advisory support could come from various OFP staff depending on the research area</li> </ul>

## Annex II: Proposed four-year budget

Item	Cost in CFP units				
	Y1	Y2	Y3	Y4	TOTAL
<b>SPC staff</b>					
National Fisheries Scientist (Capacity Building)	120,000	120,000	120,000	120,000	480,000
Monitoring & evaluation	25,000	20,000	20,000	25,000	90,000
<i>Subtotal</i>	<i>145,000</i>	<i>140,000</i>	<i>140,000</i>	<i>145,000</i>	<i>570,000</i>
<b>Stock assessment workshops</b>					
Participant costs	90,000	90,000	90,000	90,000	360,000
Teaching and Web consultancies	15,000	6,000	6,000	6,000	33,000
<i>Subtotal</i>	<i>105,000</i>	<i>96,000</i>	<i>96,000</i>	<i>96,000</i>	<i>393,000</i>
<b>Data analysis workshops</b>					
Participant costs	60,000	60,000	60,000	60,000	240,000
Statistics consultancy	20,000	12,000	12,000	12,000	56,000
<i>Subtotal</i>	<i>80,000</i>	<i>72,000</i>	<i>72,000</i>	<i>72,000</i>	<i>296,000</i>
<b>Short-term attachments</b>					
Participant costs	20,000	20,000	20,000	20,000	80,000
<i>Subtotal</i>	<i>20,000</i>	<i>20,000</i>	<i>20,000</i>	<i>20,000</i>	<i>80,000</i>
<b>Long-term attachments</b>					
Participant costs	90,000	90,000	90,000	90,000	360,000
<i>Subtotal</i>	<i>90,000</i>	<i>90,000</i>	<i>90,000</i>	<i>90,000</i>	<i>360,000</i>
<b>Graduate student support</b>					
Study visits	10,000	10,000	10,000	10,000	40,000
<i>Subtotal</i>	<i>10,000</i>	<i>10,000</i>	<i>10,000</i>	<i>10,000</i>	<i>40,000</i>
<b>Equipment (computing and printing)</b>					
Equipment	10,000	2,500	2,500	2,500	17,500
<i>Subtotal</i>	<i>10,000</i>	<i>2,500</i>	<i>2,500</i>	<i>2,500</i>	<i>17,500</i>
<b>Subtotal – operation costs</b>	<b>460,000</b>	<b>430,500</b>	<b>430,500</b>	<b>435,500</b>	<b>1,756,500</b>
SPC project management fee @ 7%	32,200	30,135	30,135	30,485	122,955
<b>Total</b>	<b>492,200</b>	<b>460,635</b>	<b>460,635</b>	<b>465,985</b>	<b>1,879,455</b>