

APPENDIX 1:

THE ECONOMICS OF FISHERIES COMPLIANCE CONTROL

INTRODUCTION:

The primary reason for undertaking compliance control in any civil system is for the maintenance of the rule of law. In the fisheries context of the South Pacific, the law is constructed from fisheries laws and regulations, agreements and treaties, and regionally agreed terms and conditions under which the productive business of fisheries is to be conducted. All these mechanisms are meant to ensure two main themes: the maintenance of the productive potential of natural fish stocks and the extraction of economic benefits from their use.

At the present time there are few major concerns about the sustainability of the tuna stocks of the South Pacific region. However, there are concerns that the most appropriate forms and levels of extraction of economic benefit are less than satisfactory. Although systems are in place which attempt to establish a fair return to the resource owners - while ensuring resource users also profit and can thus continue to participate in the fishery - the level of fair return (and how to assess it) have yet to be truly identified.

Addressing the issue of fair return is beyond the scope of this proposed study although it stems from earlier work that suggest that, for foreign fishing fleets, the marginal value of access is, in their case, an appropriate economic term.

Ensuring compliance with the goals and objectives of fisheries management is a complex and often expensive exercise. Compliance control, commonly seen as simply surveillance and enforcement, has numerous components beyond the operations aspects that this view usually conjures. These, too, have costs which together with the hardware and personnel in the front line add up to an overall economic cost that may well be very significant in terms of the overall economic benefits that can be obtained from the fishery.

In the context of access fisheries which may well be around for many years in the South Pacific, a number of questions arise that will be a common problem elsewhere.

- What level of cost/effort should be applied in compliance control to ensure the maximisation of state's benefits from foreign fisheries?
- In a fisheries regime where some/many/most of the vessels operate within the rules, what level of compliance cost should be applied to maintaining those vessels within the rules while attempting to also encompass non-compliant vessels?
- Given limited resources (from the extracted benefits from the fishery) at what level of effectiveness will the cost of compliance control completely offset any gains made from the fishery? Put another way, what net benefit - the difference between cost and income from the fishery in the long term - is acceptable? Clearly, a complete dissipation of resource rent simply in the maintenance of a fishery is unacceptable. Yet another way, what level of escapement (illegal fishing) is tolerable?

This project is proposed as a research exercise to establish some of the information needed to make such judgements. It proposes to establish in a general way but with specific application to the South Pacific tuna fishery, the fundamental economic characteristics of fisheries compliance control and the realistic expectations from such activities.

BACKGROUND:

This section will contain outline details of the current situation. As such for the purposes of this draft it is left as headers only, given the detailed knowledge that most of the people who will read this have already. It will be finalised for the eventual recipients of the proposal.

The South Pacific region contains the world's largest tuna fishery etc.
Compliance control mechanisms
Treaties and minimum terms and conditions of access
Peacesat and the MSCN
Pacific Patrol Boat Programme
Surveillance flights
Naval enforcement
Current assistance programmes - regional and national

FUTURE DIRECTIONS:

Similarly, this section will be expanded considerably in the final research proposal but is sufficient for draft purposes here.

General
Convergence of activities in the region
VMS (EC project)
Management of surveillance
Further treaties and agreements

GENERAL COMPONENTS OF THE PROJECT:

The project will undertake a number of research themes each with a set of components.

- Definition of a methodology for the study of the economics of compliance control;
- Assessment of parameters important to the understanding of fishermen's behaviour both in terms of the fishery and the control mechanisms that are applied.
- Establishment of the basic economic characteristics of and requirements for a compliance control system for the South Pacific tuna fisheries; and
- Evaluation of the ways in which compliance control systems can lead to improvements in net state benefits, and how optimisation (excluding market effects) of all factors can be determined towards maximisation of these benefits.

DEVELOPMENT OF A RESEARCH METHODOLOGY:

In an investigation of this kind it will be important to establish the scope of the research and the ways in which it can and should be approached in the particular circumstances of the South Pacific. It will, therefore, be important at the outset to work closely with the Forum Fisheries Agency, its professional personnel working on the issues and with relevant officials of national governments to define a working methodology and work programme. These would include the detailed areas to be investigated.

Initially, a literature review would be undertaken to provide base information on a number of issues, particularly with regard to how to investigate and analyse some aspects of fishermen's patterns of behaviour and their perception of risk.

During these early investigations numerous specific topics for research will be identified as outlined in the following section. How far each of these will be investigated will depend on the agreed methodology for the project.

DETAILED AREAS TO BE INVESTIGATED:

Policy and Planning:

There are a number of features of compliance control that are somewhat outside the normal scope of what is considered the core of surveillance and enforcement. Nevertheless, it is important to recognise that almost any activity (at national and regional levels) that is meant to ensure DWFNs meet all conditions of access and therefore act in accordance with the authority of resource owners, is part of the general economic framework of compliance control. These will include a number of features of substance such as:

- Policy, planning, decision making and definition of management rules
- Flag State Responsibility and Cooperation
- Understanding fishermen's behaviour and their likely responses to compliance control mechanisms
- Understanding fishing fleet dispositions and activities

Implementation of compliance control:

Depending on the scope of the work programme and required methodology the project will investigate the economics of all aspects of compliance implementation including:

- Personnel and training
- Hardware, system design and procurement
- Operations planning and deployment
- Information and Communication Systems
- Surveillance patrols (aerial and naval)
- Pursuit and Interception
- Boarding, Inspection, Arrest and Escort
- Administration of apprehended vessels and crews
- Prosecution and the Judicial process
- Administration of sentences
- Estimating overall economic costs of surveillance and enforcement

KEY RESEARCH ISSUES:

As a result of investigations, both general and specific, there will be a number of major issues that can to be addressed in the project. These break down into two main areas: planning and the economics of surveillance and enforcement.

Planning issues:

The key issues in the planning of compliance control activities, particularly in fisheries where there are severe limits to the scope and extent of surveillance capability, revolve around the use of information on the nature of the fishery, particularly its spatial and temporal distribution, and the likely effects of any surveillance and enforcement activity (and other aspects of compliance control) on the behaviour of fishermen. These issues may be summarised as follows:

- **Estimating the probability of detection**

The characteristics of the surveillance platforms can be used in a theoretical and practical approach to assessing the probability that illegal fishing vessels will be detected. This can also be set against actual detection events.

■ **Use of information and the probability of detection**

Fishing patterns analysis, particularly when compliant vessel position information becomes real time (under the VMS), and other information, and the ways that it might be used in increasing detection probability.

■ **Detection technologies and systems**

What are the likely medium term improvements to detection that might be expected.?

■ **Risk assessment in illegal fishing**

What chances do fishermen take in illegal fishing and under what circumstances do they do it? How would an 'Honesty Coefficient' be determined? How do fishermen make their decisions to act legally or illegally, to assess the level of risk they take? How might patterns of current fishery activity and knowledge, or direct assessment, be used to analyse the response of fishermen to compliance control activities?

Assessment of the economics of surveillance and enforcement:

■ **Assessment of economic loss**

How might the level of economic loss caused by non-compliance (under-reporting, illegal fishing etc) be estimated? What means are available to do this?

■ **Assessment of overall economic cost**

What components of the overall compliance control system should be included in an analysis of economic cost? How might the financial and economic cost of these be determined?