

Draft Strategy for

Managing the

Environmental Effects

of Fishing

New Zealand Ministry of Fisheries

Te Tautiaki i nga tini a Tangaroa

(Guardians of the multitudes of Tangaroa)

31 March 2003

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Part 1: Introduction

OVERVIEW

Purpose

- 1 The purpose of the Ministry of Fisheries Strategy for Managing the Environmental Effects of Fishing is to:
 - implement an Ecosystem Approach to Fisheries
 - make significant improvements in managing the environmental effects of fishing
 - ensure the Ministry of Fisheries (MFish) meets its environmental obligations under the Fisheries Act 1996 and other legislation in an efficient and consistent manner.

Background

Ecosystem Approach to Fisheries Management

- 2 Worldwide, there is increasing recognition of the need to manage the effects of fishing on the aquatic environment. Recent publications and conferences have highlighted the potential adverse effects of fishing practices on the aquatic environment and extensive work is being undertaken on methods to manage these effects—including proposals for networks of marine protected areas and development of mitigation techniques to reduce catches of non-target species.
- 3 Ecosystem-Based Management and Ecosystem Approach to Fisheries (EAF) are the terms commonly used to describe the type of management proposed to address ecosystem-related issues. In this document, the latter term is used since it avoids any sense that management is aimed at controlling aquatic ecosystems. Instead it focuses on how the effects of fishing on aquatic ecosystems can be better addressed in the management of fisheries.
- 4 EAF does not replace existing fisheries management but rather builds on existing management by incorporating additional ecosystem considerations. Good management of target fish stocks is fundamental to managing the broader environmental effects of fishing—but is not enough. Historically, most fisheries management systems have started with a focus on individual stocks. They typically progress to addressing the effects of fishing on non-target species such as marine mammals and birds, and major fish bycatch species. Some have developed still further to start to address the effects of fishing on benthic habitats. Only a few have developed as far as addressing indirect effects of fishing on marine ecosystems such as effects on the food chain.
- 5 Adopting EAF will incur significant costs. The Government will face increased monitoring and management costs, stakeholders will face increased business compliance costs, and the level of utilisation of fisheries resources will likely be constrained. However, these costs will be offset by the increased value obtained from sustainable fisheries resources and a healthy aquatic environment. The government's

task is to determine the appropriate balance so that the value of these resources to New Zealanders can be maximised.

- 6 Some methods proposed for implementing EAF require large amounts of information, are costly, and require an understanding of marine ecosystems that is currently beyond the ability of science to deliver. This has a number of implications for fisheries management including:
 - EAF can only be adopted in a staged manner with developments in management keeping pace with increased information availability
 - Innovative, cost-effective methods for implementing EAF should be sought
 - Where there is insufficient information with which to address a particular effect of fishing on marine ecosystems, a cautious approach to management should be adopted
- 7 EAF is consistent with moves to implement Sustainable Development. Sustainable Development is described as, “Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”. Typically, Sustainable Development is considered to have three main components: environmental, economic and social. In New Zealand, we choose to identify the cultural component of sustainable development as an additional component.

Ecosystem Approach to New Zealand Fisheries Management

- 8 The context within which this Strategy will operate needs to be clearly understood and the purpose of the Strategy must be consistent with legislation and New Zealand’s international obligations. In particular, the Strategy must give effect to the requirement *to provide for the utilisation of fisheries resources while ensuring sustainability*—the purpose of the Fisheries Act 1996.
- 9 The purpose of the Fisheries Act 1996 establishes a clear focus on people utilising fishery resources to provide for their social, economic, and cultural well-being. Utilisation is to occur within limits—including the requirement to ensure sustainability. This focus on the use of fishery resources reflects the fact that we value the different ways that fishery resources can contribute to our well-being, including employment and economic returns from a profitable seafood industry, enjoyment from high quality recreational fishing, and the contribution that customary use of fishery resources can make to Maori. It means that we do not adopt a “protection at all costs” approach to conserving marine biodiversity, nor do we unnecessarily restrict fishers from utilising fishery resources by the most efficient means. Instead, we aim to achieve a balance that allows fishery resources to be used while ensuring that the effects of fishing on fishery resources and the ecosystems in which they occur do not compromise their sustainability.
- 10 In many respects New Zealand is well placed to incorporate additional ecosystem considerations into its fisheries management systems. Most importantly, the New Zealand fisheries management system provides mechanisms by which catches of individual fish stocks can be limited and the Quota Management System (QMS) provides a mechanism by which fishing effort can adjust to match the available yield. In their summary of the Scientific Symposium at the 2001 Reykjavik Conference

Responsible Fisheries in the Marine Ecosystem the co-convenors concluded that reducing overfishing driven by overcapacity is a critical first step in implementing an Ecosystem Approach to Fisheries. They also noted that a rights-based system is usually required to achieve this reduction. New Zealand is one of the few countries that has addressed these issues in a comprehensive manner and, as a result, has largely reduced excess fishing effort and capacity.

- 11 In addition to implementing the QMS, New Zealand, like many other countries, has developed a range of initiatives to address specific issues related to the effects of fishing. These include establishing marine reserves, restricting fishing methods, operating observer programmes, imposing marine mammal non-target catch limits, and requiring fishers to use non-target catch mitigation devices. However, to date, these initiatives have been largely reactive and somewhat ad hoc.
- 12 The enactment of the Fisheries Act 1996 signalled a change of course towards EAF as an underlying principle for fisheries management. The Act establishes a set of strong environmental obligations, including requirements to:
 - avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment
 - meet the foreseeable needs of future generations
 - be cautious when information is uncertain, unreliable or inadequate
- 13 There is explicit recognition of environmental obligations in a number of MFish processes that require effects on the aquatic environment to be addressed specifically. However, there is no MFish-wide strategy describing how MFish will meet its obligations to manage the effects of fishing on the aquatic environment across all its processes and activities. There is a widely held view, both within MFish and by fishery stakeholders¹, that MFish should do more to meet these environmental obligations.
- 14 In his 1999 report, *Setting Course for a Sustainable Future, the Management of New Zealand's Marine Environment*, the Parliamentary Commissioner for the Environment concluded that the lack of knowledge about marine ecosystems and poorly integrated management regimes cannot ensure sustainable management of resources. An intention to make substantial progress in this area was signalled in the MFish Strategic Plan in 1998. The *Strategy for Managing the Environmental Effects of Fishing* will guide MFish in this process. The environmental principles in the Fisheries Act 1996 form the basis for the development of this Strategy.

Scope

- 15 The success of any strategy depends on clearly identifying what is in scope and what is out of scope. MFish is involved in a wide range of issues impacting on the state of the aquatic environment. A deliberate choice has been made to restrict the scope of this Strategy to a subset of these issues. This way, progress can be made in these high priority areas, rather than having effort dissipated.

¹ In this Strategy, *stakeholder* or *fishery stakeholder* means people or groups with a particular interest in the management of fishery resources. It includes environmental interests, and commercial, customary, and recreational fishers. To the extent that members of the public have an interest in the management of fisheries resources, they too are covered by the term.

- 16 While this Strategy does not address all concerns about the marine environment, the process of identifying areas not addressed is useful. It helps identify where effective linkages are needed and identifies areas that may need to be addressed in the future, either by MFish or as part of a wider exercise like the government’s Oceans Policy initiative.
- 17 The scope of this Strategy is about management of the adverse effects of fishing on the aquatic ecosystem. In this Strategy, the term *fishing* refers to commercial, customary and recreational fishing. MFish has management responsibility for fisheries in both marine and freshwater environments. The frameworks contained in this Strategy are applicable to the adverse effects of all fishing (excluding whitebait, and salmon and trout fishing, which are managed under conservation legislation). An action proposed in this Strategy is to assess the need for any specific requirements for managing the effects of freshwater fishing on the aquatic environment.

Out of Scope

- 18 This Strategy does not directly address management of target fishstocks, biosecurity, aquaculture, and non-fisheries effects, all of which can have adverse effects on the aquatic environment. These matters are addressed elsewhere, as indicated in Table 1. Development and implementation of this Strategy will be integrated with these related initiatives.

Table 1. Scope of this Strategy

	Issue	Responsibility for this Issue
In Scope	Effects of commercial, customary and recreational fishing on the aquatic environment: <ul style="list-style-type: none"> • Non-target catch (by-catch) • Habitat • Indirect effects (e.g. food web interactions) 	This Strategy
Out of Scope	Target fish stock management	General MFish management processes; Fish Stock Strategies; Fisheries Plans
	Whitebait, salmon and trout fishing	Department of Conservation
	Marine biosecurity	New Zealand Biosecurity Strategy; MFish responsible for managing marine biosecurity risks
	Aquaculture	Regional Councils
	Adverse effects associated with general marine industries and activities e.g. fuel spills	MSA-administered controls; Regional Councils; greenhouse gas policies etc
	General discharges from vessels	Marine Pollution Agreements; MSA-administered controls; Regional Councils
	Land-based effects on the aquatic environment e.g. sedimentation; nutrient run-off	Regional Councils

- 19 Central to fish stock management is ensuring catch levels are sustainable. Limits on commercial harvest are set for all stocks fished commercially, and all stocks in the QMS are subject to a Total Allowable Catch (TAC). It is expected that the management approach for each fishery or group of fisheries will be documented in a Fish Stock Strategy prepared by MFish or in a Fisheries Plan developed by stakeholders. Both Fish Stock Strategies and Fisheries Plans will need to be consistent with the requirements of this Strategy.
- 20 MFish has lead responsibility for marine biosecurity. Work will continue on matters such as hull fouling and ballast water controls to reduce the risk of unwanted incursions and maintain the quality of New Zealand's aquatic environment, but is not part of this Strategy.
- 21 Currently MFish's main role in aquaculture is to assess whether a proposed marine farm would have an undue adverse effect on fishing and the sustainability of fisheries resources. Regional councils have the primary role in undertaking assessment of effects on the environment. Proposed new arrangements for aquaculture management will require regional councils to have regard to the effects (including cumulative effects) of aquaculture activities on the environment. Therefore, effects of aquaculture on the aquatic environment are not addressed in this Strategy.
- 22 Nor does this Strategy address adverse effects common across marine industries, such as the effects of fuel spills (managed by the Maritime Safety Authority (MSA) and regional councils). Also excluded is the discharge of general waste from fishing vessels. MFish considers these issues are more appropriately dealt with by regional councils (within the territorial sea), and MSA, under MARPOL, the international agreement dealing with maritime pollution issues.
- 23 Land-generated pollution and sedimentation are two key examples of activities that have significant effects on the coastal environment. Regional councils deal with these issues under the Resource Management Act 1991. MFish has a limited role. However managing land-sea interactions is being addressed as part of the government's Oceans Policy exercise. The draft MFish Strategic Plan for 2003-2008 includes an action to "contribute to the development of a framework to manage the effects of non-fishing uses, including land-based effects, on the aquatic environment, including determining an appropriate role for MFish".

Linkages

- 24 The Strategy needs to be integrated with existing processes involving management of adverse effects on the marine environment. These include processes within MFish such as stock assessment and research planning, which are discussed later.
- 25 A number of initiatives external to MFish also link to this Strategy. Key initiatives include the New Zealand Biodiversity Strategy, and the Marine Protected Areas (MPA) Strategy that is under preparation as an action to implement the Biodiversity Strategy. The MPA Strategy has significant overlap with the management of aquatic habitat area covered in this Strategy. The key overarching marine management initiative is the government's Oceans Policy currently being developed. This Strategy is designed to

complement other initiatives. Figure 1 shows the linkages between key Government initiatives.

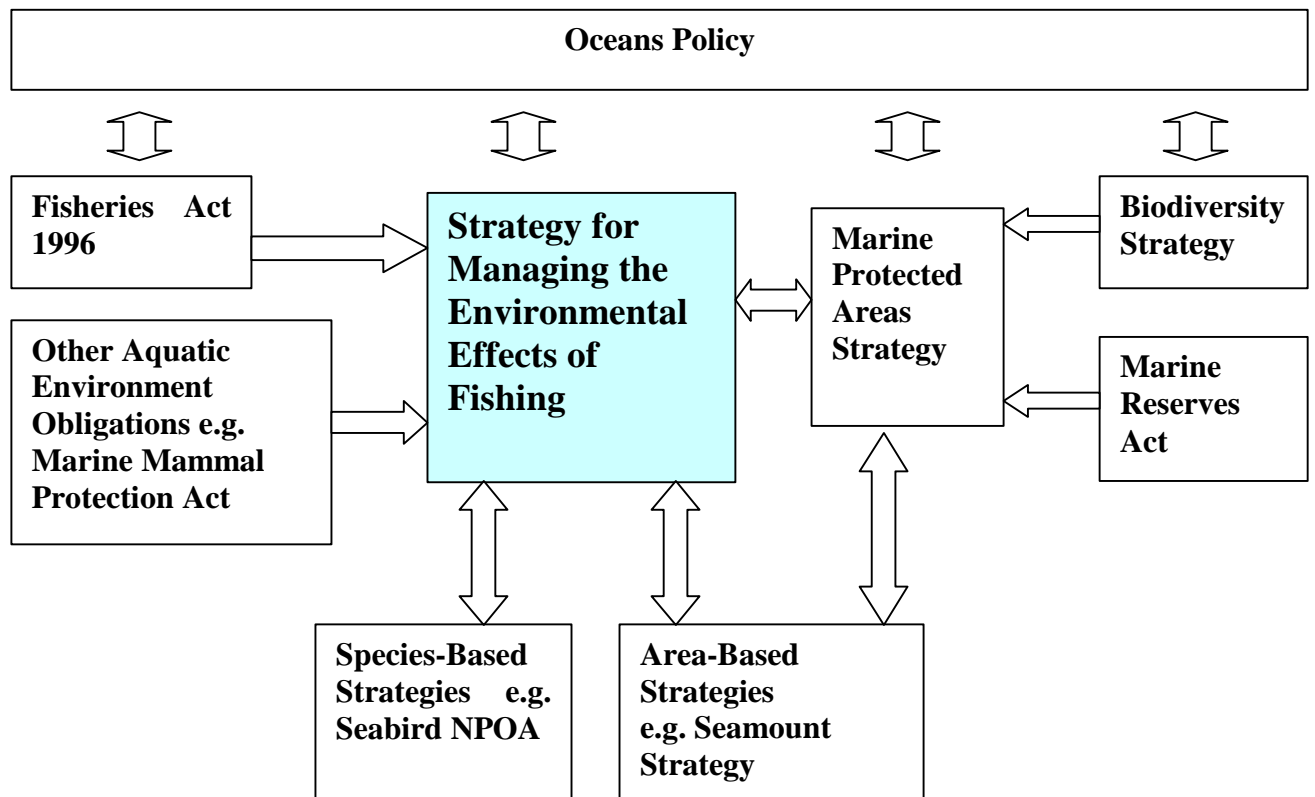


Figure 1. Key Government Initiatives Relating to Managing the Effects of Fishing on the Aquatic Environment

Key Changes

- 26 This Strategy builds on existing MFish management approaches and draws on existing processes and strategies. However, in some areas, the Strategy signals important changes in the way MFish addresses environmental issues. Key changes include:
- Clearly identifying Government responsibilities and those that may be undertaken by stakeholders
 - Emphasising the role of government-set standards² for managing effects of fishing while providing maximum flexibility for how the standards are achieved
 - Regularly assessing and reporting on the status of species and habitats affected by fishing activities

² *Standard or Environmental Standard* is used in this Strategy to describe a government-set policy establishing a rule or limit concerning the acceptable level of an effect on the aquatic environment. Refer to the later section *Setting Standards to Manage Effects of Fishing* for relevant discussion.

- Implementing a proactive approach to the management and protection of species and habitats affected by fishing activities
- Requiring an assessment of the risks to the aquatic environment posed by a fishery to be undertaken for all fisheries within a specified timeframe
- Requiring that the management regime demonstrate how the fishery will meet environmental standards
- Establishing specialist roles within MFish focused on understanding and managing the effects of fishing
- Providing for more effective stakeholder input to managing the effects of fishing on the aquatic environment

Immediate Actions

27 Implementation of this Strategy will occur over a number of years, consistent with the availability of information and resources, and with the rate of change that is feasible in the different sectors of the fishery. However, the Strategy proposes a number of steps that should be commenced immediately. These include:

- Identify MFish staff members responsible for providing advice on and developing standards to manage the effects of fishing on the aquatic environment
- Commence work on the development of standards to manage the effects of fishing on the aquatic environment
- Establish an Aquatic Environment Management Advisory Group, comprising representatives of fishery stakeholders, tangata whenua and relevant government agencies, to advise MFish on the development of standards to manage the effects of fishing on the aquatic environment
- Extend the application of the species threat classification system to cover additional non-target species

Format

28 The remainder of this Strategy is set out as follows.

- Part 2 describes current management of and research on the effects of fishing on the aquatic environment and contains a discussion on the advantages and disadvantages of output and input control approaches to management.
- Part 3 describes the proposed framework for managing the effects of fishing on the aquatic environment.
- Part 4 provides more detail on proposed management, focusing on specific areas of non-target catch, aquatic habitats and indirect effects.
- Part 5 contains the glossary and a summary of the proposed actions to implement the Strategy.

Proposed actions to implement this Strategy are contained in boxes in relevant parts of the document. It should be noted that these proposed actions are subject to funding and will be considered in the Ministry's annual business planning process.

Some of the actions identified in this Strategy are already being implemented; others will be proposed in relevant MFish business planning documents, and in research proposals. Final decisions on the proposed actions will depend on priorities and the availability of funding.

Part 2: Current Management

CURRENT MANAGEMENT OF THE EFFECTS OF FISHING

Introduction

- 29 Current management of the effects of fishing on the aquatic environment is based around different environmental obligations. Based on these obligations, management of adverse effects can be considered in three general categories:
- Managing the effects of fishing on non-target species
 - Managing the effects of fishing on aquatic habitats
 - Managing indirect effects of fishing on aquatic ecosystems
- 30 Clearly, there is overlap between these categories. For example, management of the effects of fishing on aquatic habitats also influences the effects of fishing on sedentary non-target catch species that occur in that habitat.
- 31 This section sets out the main environmental obligations applicable to each of the three identified categories of management and describes current systems and practices. In each of the three areas, controls are implemented primarily through the annual MFish Sustainability Measures Process. In some situations, sustainability measures are implemented through voluntary agreements between fishery users, but in most cases they are implemented through notices or regulations.

Managing Non-Target Catch

- 32 Most types of fishing operations take unwanted catches—often referred to as by-catch. There are a number of types of unwanted or non-target catch, which can be categorised as:
- Damaged and undersize fish of the target species
 - Non-target fish species for which the harvester does not hold catching rights (annual catch entitlement (ACE), or permit), although catching rights are held by others.
 - Associated or Dependent Species: All marine mammals, seabirds, fish species, and benthic animals and plants for which no targeted fishing is permitted but which are affected by fishing targeted at other species. When taken as a non-target catch in legitimate fishing operations, catches of some Associated or Dependent Species may be sold.
 - Protected Species: A subset of Associated or Dependent Species that are specifically protected under the Wildlife Act 1953 or the Marine Mammal Protection Act 1978. These species may not be landed for commercial gain. Protected Species includes seabirds, marine mammals, and corals. Species are designated as protected not necessarily because they are at risk of serious decline but because a decision has been made that they should not be available for commercial exploitation—even when taken as an unintended non-target catch. Those Protected Species that are considered to be at risk of serious decline can be

further designated as threatened by Gazette Notice under the Wildlife Act or the Marine Mammal Protection Act.

- 33 This Strategy focuses on management of non-target species for which no commercial fishing rights are granted (i.e. Associated or Dependent Species—including Protected Species). Management of damaged and undersize fish for which commercial catching rights are held will be addressed in the context of management of target commercial fish stocks.

Associated or Dependent Species

- 34 MFish has primary responsibility for the management of the effects of fishing on Associated or Dependent Species (including Protected Species). Relevant obligations are contained in the Fisheries Act 1996:
- Associated or Dependent Species should be maintained above a level that ensures their long-term viability (Section 9(a)). Long-term viability is defined as, “...a low risk of collapse of the stock or species, and the stock or species has the potential to recover to a higher biomass level”.
 - Biological diversity of the aquatic environment should be maintained (Section 9(b)). Biological diversity includes diversity within species, between species, and of ecosystems.
- 35 MFish has commissioned some research on catches of Associated or Dependent Species but for many species there is little information on population status or the effects of fishing. In the absence of good information about a large number of Associated or Dependent Species, management has, for the most part, been reactive. Where there is information suggesting that fishing is having an adverse effect on one or more species, evidence is sought and, where appropriate, management measures are developed through the sustainability measures process, and implemented.

Protected Species

- 36 While MFish has primary responsibility for managing the effects of fishing on Protected Species, DoC also has a strong interest in this area due to its legislative responsibility for the overall management of Protected Species. Relevant obligations are contained in the Marine Mammals Protection Act 1978, the Wildlife Act 1953, and the Fisheries Act 1996. Specific Fisheries Act 1996 obligations in respect of Protected Species are set out in section 15. Section 15(1) requires that, where a population management plan (PMP) has been approved under the Wildlife Act or the Marine Mammals Protection Act, the Minister:
- is required to take all reasonable steps to ensure that the maximum allowable fishing-related mortality level set by the relevant PMP is not exceeded
 - may take such other measures as he or she considers necessary to further avoid, remedy, or mitigate any adverse effects of fishing on the relevant Protected Species.
- 37 Section 15(2) specifies that, in the absence of an approved PMP the Minister of Fisheries may, after consultation with the Minister of Conservation, take such measures as he or she considers are necessary to avoid, remedy, or mitigate fishing-related

mortality on any Protected Species. Management measures taken under s15 may go beyond merely ensuring that the species remains above a level that ensures viability.

- 38 To date, no PMPs have been approved and all management of fishing activities under the Fisheries Act in relation of Protected Species has been taken under section 15(2). A range of management measures designed to mitigate the effects of fishing on Protected Species have been implemented under the Fisheries Act. They include:
- closing a fishery once a specified maximum allowable fishing-related mortality level has been reached e.g. Auckland Islands Squid (6T) Fishery
 - requiring mitigation technology to be used e.g. use of bird-scaring Tori lines on vessels setting longlines
 - restricting fishing methods in specified area e.g. restrictions on the use of set nets to reduce accidental catch of Hector's dolphins
- 39 In addition to management measures under the Fisheries Act 1996, marine mammal sanctuaries that have the effect of banning fishing or restricting fishing methods in specified areas have been implemented under the Marine Mammal Protection Act 1978.
- 40 Groups within the seafood industry have also developed codes of practice designed to minimise the effects of fishing on Protected Species. Examples include:
- Code of practice for mitigating seal and sea lion bycatch
 - Code of practice for the mitigation of seabird bycatch in New Zealand blue-nose fisheries
 - Tuna charter vessel code of conduct for avoiding seabird mortalities
- 41 Both MFish and DoC operate information collection programmes in relation to Protected Species. These include:
- MFish reporting system to record reports of captures of Protected Species
 - MFish Observer Programme designed to collect information on the effects of fishing on Protected Species
 - DoC research on the status of Protected Species
 - DoC research on development of mitigation measures
- 42 These programmes are funded primarily through Conservation Services Levies and Fisheries Services Levies (both collected from industry). Further research on Protected Species is funded through the Public Good Science Fund.

Managing Aquatic Habitat

- 43 Specific habitat-related environmental obligations include requirements to:
- maintain biological diversity of the aquatic environment (including diversity within species between species, and of ecosystems)
 - maintain Associated or Dependent Species above a level that ensures their long-term viability

- protect habitat of particular significance for fisheries management
- 44 Current MFish management of aquatic habitats is largely driven by stakeholder concerns about specific areas. Where a concern is considered important, research is undertaken and, depending on the results, the area may be closed to fishing or method restrictions may be imposed through the Sustainability Measures Process. MFish does not have an overall plan for the protection of aquatic habitats and, despite interdepartmental consultation on specific proposals, there are no formal processes by which MFish and DoC coordinate the use of the two main marine habitat protection tools—Fisheries Act regulations and marine reserves.
- 45 Environmental stakeholders have expressed concern that, under the current MFish approach to protecting aquatic habitat, specific areas of habitat are generally not protected from the effects of fishing until such protection is shown to be required. There may be no protection where the effects of fishing on a particular habitat are unobserved. The time taken to investigate suggestions of the effects may result in further damage to vulnerable habitat before appropriate protection is implemented.
- 46 An increasing amount of research is being undertaken on the generic effects of fishing methods and on habitats of particular significance to fisheries management.

Managing Indirect Effects of Fishing

- 47 This area concerns management of the effects of fishing occurring indirectly through predator-prey or similar relationships. For example, a fishery may target a particular species that is a major food source of a seabird, marine mammal or another fish species. Although the predator species may not be directly affected by the fishing activity, its survival may be impaired by the reduction in the availability of its major food source.
- 48 In addition to the general obligations under sections 8 & 9 of the Fisheries Act 1996, two obligations apply to food webs, systems and processes:
- Section 11(1)(a) requires that, when setting or varying any sustainability measure, the Minister must take into account, any effects of fishing on any stock and the aquatic environment (which includes indirect effects on non-target stocks).
 - Section 13(2) requires that, when setting a TAC, the Minister must set a TAC that maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks
- 49 Management of indirect effects of fishing on the aquatic environment is characterised by poor information both in New Zealand and worldwide. In New Zealand, there is little quantitative data on the effects of reducing the stock size of target fish species on other species, but such considerations have been taken into account in setting management measures. An example is that the likely importance of anchovy as food for seabirds resulted in a lower TAC level being recommended for this species than would otherwise have been recommended—despite there being no quantitative information on the dependence of seabirds on anchovy.

RESEARCH AND INFORMATION

Overview

- 50 Worldwide, there is a paucity of information on the structure and functioning of many aquatic ecosystems and the effects of fishing. This situation results from a combination of factors including the complexity and inaccessibility of many aquatic ecosystems, and means that research is often expensive and results characterised by high levels of uncertainty. These problems are exacerbated by the common view that aquatic environment research is a low priority compared with fish stock research. The result is a level of information on aquatic ecosystems that provides a less-than-ideal basis on which to incorporate further ecosystem considerations into fisheries management.
- 51 Implementation of an Ecosystem Approach to Fisheries—especially in New Zealand—will need to cope with this lack of information. A particular challenge for New Zealand is the relatively small amount of research funding available compared with larger countries. With only limited research funding, New Zealand will have to rely on the results of overseas research and manage fisheries in a way that both maximises the value of research and takes into account the limits on information availability. In the long term, this will likely prove a better approach than trying to make up for poor management systems by obtaining more and more information—an approach that will prove very expensive and will likely be unsuccessful.

Information Sources

- 52 In New Zealand, research relevant to managing the effects of fishing on the aquatic environment is commissioned by a number of organisations. These organisations, and the estimated cost of relevant work commissioned by them are shown in Table 2.
- 53 The costs of most research commissioned by MFish and DoC (Conservation Services) are recovered from the seafood industry through Fishery Services Levies and Conservation Services Levies respectively. Other research commissioned by government departments is funded through general taxation.
- 54 When developing advice to the Minister of Fisheries on proposed aquatic environment research projects MFish is guided by the Aquatic Environment Medium-Term Research Plan and consults with the Aquatic Environment Research Planning Group. The Aquatic Environment Working Group reviews relevant research results and advises MFish on the use of the results. (These groups are described in a later section).
- 55 In general, MFish-commissioned research is driven by fishery management requirements. Therefore, in light of the limited consideration of environmental effects in fisheries management it is not surprising that detailed information has been generated on a relatively restricted range of aquatic habitats and non-target species. There is also a widespread view that better use could be made of the results of the limited research that has been undertaken, when managing the effects of fishing.

Table 2. Research Related to Managing Effects of Fishing on the Aquatic Environment

Organisation/Fund	Nature of Research	Year	Research Investment (000s)
MFish	Effects of fishing on the aquatic environment	1999/00 -2001/02	\$328 ³
DoC (Conservation Services)	Effects of fishing on the aquatic environment; Mechanisms to reduce non-target catch or marine mammals and seabirds	2002/03	\$3,000
Foundation for Research Science and Technology (Public Good Science Fund)	Research Portfolios of major relevance are Biodiversity (Marine) and Environmental Protection (Marine). Other portfolios with some relevance include: Biosecurity (Marine) and Environmental Protection (Land, Freshwater and Estuaries).	2002/03	\$6,754 (Major portfolios only)
Biodiversity Fund (Jointly organised by MFish; DoC; MfE)	Improved understanding of marine biodiversity of the New Zealand EEZ and the Ross Sea Region	2001/02	\$846

³ This figure is the average expenditure in the last three years. There is considerable annual variation because some individual projects extend over more than one year. These figures relate only to research commissioned under the Aquatic Environment Research Portfolio. In recent years similar research has also been commissioned in other MFish research portfolios. As such, the figures do not fully reflect all the aquatic environment research.

CONTROLLING FISHING: INPUT AND OUTPUT CONTROLS

Fisheries Management Controls

- 56 This Strategy is designed to ensure that the environmental obligations under the Fisheries Act 1996 and other legislation are met in an efficient and consistent manner. The Strategy is focused on managing the effects of fishing and, therefore, most of the measures and controls proposed in the Strategy are those traditionally used to manage fisheries. However, in the context of the Strategy, these traditional fishery controls are intended to achieve environmental objectives.
- 57 Fisheries management involves the use of a range of measures that control fishing activities in various ways to limit the effect of those activities. Without any controls, the common pool nature of fisheries resources results in loss of economic rent and usually over-exploitation. Each measure has advantages and disadvantages and may be more or less suitable for use in a particular situation and for use in combination with other measures. Each fisheries management system comprises different combinations of these measures, and the combination usually changes over time.
- 58 Fisheries management in New Zealand is currently undergoing significant change. Management of many species is being brought under the Quota Management System, there are changes proposed for the management of species that remain outside the Quota Management System, and the implementation of this Strategy will result in a broadened focus for fisheries management. Therefore, it is timely to consider the optimum combination of measures that could be used to manage the effects of fishing on both target fish stocks and the wider aquatic environment. This Strategy does not prescribe the type of control that is to be used but is intended to identify the range of controls that could be used and encourage the adoption of the most appropriate measures for a given situation.

Purpose of Output and Input Controls

- 59 Fisheries management measures are typically classified as either input or output controls. Traditionally, most fishery management systems used only input controls but, more recently, an increasing number of management systems have started using output controls. In some management systems output controls dominate but nowhere have input controls been eliminated.
- 60 Input and output controls represent two fundamentally different approaches to fisheries management. In a system based on output controls, the maximum amount of a species that can be taken from a specified area within a specified period is determined and fishers are restricted from taking any more than this. In an input control based system, the total catch of a species is not controlled directly, but is influenced by controlling the amount and type of fishing activity that is permitted.

Input Controls

- 61 There is a wide range of input controls and they can be used for different purposes. Some are designed to protect specific habitats, non-target species, or particular stages of the target species' life cycle e.g. juveniles or egg-bearing animals. Input controls are often the most effective means of achieving this type of protection and they are also used for this purpose in fishery management systems based on output controls. This type of input control is usually spatially based and examples include closed areas, closed seasons, method restrictions, minimum legal sizes, and minimum escape gap requirements.
- 62 Other input controls are designed primarily to restrict the amount of a target species that is taken. Examples of this type of input control include limits on fishing effort in terms of number and size of vessels, the number of fishing days, and number of pots/hooks/tows, and prohibiting the use of certain fishing methods. The purpose is to make it more difficult (and expensive) to catch the target species thereby reducing the incentive to fish. Use of input controls for this purpose has been referred to as 'regulated inefficiency' and in most fisheries yields poor economic results. Fishers have strong incentives to improve catches by enhancing the unregulated components of their fishing operations e.g. engine horsepower or winch size. This encourages inefficient investment, and the resulting increase in fishing effort requires the fisheries management agency to impose additional and/or more restrictive controls on fishing operations in order to limit catches. In some fisheries where the number of days fishing is the primary management control, fishing capacity has increased to the point where the annual catch is taken in a matter of a few days—clearly an inefficient use of capital.
- 63 Mandatory input controls can provide a mechanism for implementing and enforcing existing best practice in managing fisheries. However, by effectively outlawing any alternative practices that might be employed to the same end, they can stifle innovation. As such they do not support the objective of achieving ongoing improvements in management.

Output Controls

- 64 Output controls are used primarily for restricting the catch of target species, although they have also been used to limit the catch of particular non-target species. Provided the appropriate catch limit for a species can be determined and enforced, this type of control can be effective in managing target stocks. However, where the catch limit is competitive, there are strong incentives for fishers to continue investing in fishing capacity to enable them to take a greater proportion of the catch limit prior to the limit being reached and the fishery closed. Fishing seasons may become shorter as the catch limit is reached earlier. This is occurring in the New Zealand fishery for southern bluefin tuna. The intense fishing effort may also make it difficult to obtain catch information in a sufficiently timely manner to be able to close the fishery when the catch limit has been reached.
- 65 In order to address this problem of overcapacity, output controls are commonly used in conjunction with other controls. Some management systems use input controls in an attempt to restrict the amount of fishing effort to match the competitive catch limit. However, in an increasing number of fisheries the overall catch limit is used in

conjunction with individual catch limits. These individual catch limits may or may not be tradable. Allocating individual catch limits largely eliminates the race to maximise catch and creates incentives for individuals to ensure ongoing sustainability of the resource. The greater certainty provided to fishers gives increased incentives for them to match their investment in fishing capacity to their individual catch limit. Where tradability is permitted, catching rights will tend to be bought by those who are able to obtain the maximum value from the catching right.

- 66 Managing by means of a strict catch limit means that, where the limit is breached, the fishery will be closed or fishers will be required to shift or otherwise modify their fishing operations. This has the potential to cause considerable disruption not only to the target fisheries but also to other fisheries in which the species is taken as a bycatch. Incentives to misreport catches and to discard catch will also increase.

Economic Instruments

- 67 Economic instruments can also be used to influence fishing activities. They are sometimes classified as input controls but are more appropriately considered separately. Economic instruments have frequently been used in a way that promotes excess fishing (e.g. subsidies) but they can be used to promote desirable fishing activities.
- 68 Economists have suggested that a tax on catches could be used instead of input controls to limit the harvest of target species to sustainable levels. However, the differences in economic performance of different fishing operations in the same fishery means that it would be very difficult to determine an appropriate tax rate to achieve the desired catch level and increasing efficiency on the part of fishing operations would necessitate an increasing tax rate. This method has proved politically unacceptable in many countries—not surprising since many countries still subsidise their fishing industries. In New Zealand, financial disincentives are used to discourage fishers taking catch, but only catch in excess of their catch entitlement for target stocks. Economic instruments could be used in a similar manner to manage the effects of fishing on non-target stocks and habitats, although they are currently not used for this purpose in New Zealand.

New Zealand Fisheries Management Model

- 69 New Zealand fisheries management relies on input and output controls, and economic instruments. Output controls are the preferred management approach for target fish stocks and to this end the QMS provides a sophisticated output control management system. Most major commercial fisheries are managed in the QMS and management of many other species is also being transferred to the QMS.
- 70 The New Zealand fisheries management also retains a strong reliance on input based controls. A few are a hangover from before the introduction of the QMS in 1986 and are designed to limit the catch of target species. However, most input controls are designed either to allocate access to fisheries between fishing extractive fisheries users (commercial, recreational, customary), or are designed to limit the effects of fishing on non-target species, habitats, and particular stages of target species life-cycles. Financial disincentives are used to discourage catch in excess of catching entitlement.

- 71 The Fisheries Act 1996 reflects the dual system of controls (output and input) used to manage fisheries in New Zealand. A number of output-based targets are explicitly identified in the Act. Stocks managed in the QMS are required to have a Total Allowable Catch (TAC) set. The TAC is based on the statutory target level identified in either ss 13, 14, or 14B of the Act. The Act also enables an output-based target to be set for non-QMS stocks (a catch limit or commercial catch limit) and protected species (either a maximum allowable fishing related mortality level or a limit on fishing related mortality).
- 72 The Act provides a very broad scope for input-based controls but does not provide an exhaustive list of input based controls that may be implemented. Section 11(3) indicates that both output and input based controls can be used to meet the requirement for sustainability in Section 8 of the Act and the environmental principles in Section 9. However, the Act does not contain any explicit preference for how this is to be achieved (ie whether by input or output based control).

Future Direction of Fisheries Management in New Zealand

- 73 The introduction of the 1996 Act brought about a new direction in the management of New Zealand's fisheries. Specifically, the Act sets new requirements for the management of fish stocks and explicitly requires the effects of fishing on the aquatic environment to be addressed. This includes the requirement to ensure that Associated or Dependent species are managed above a level that ensures their long-term viability. The challenge is to utilise an appropriate combination of available fishery management measures to achieve these obligations.
- 74 It is clear that all target fisheries should be managed in the QMS. It is also clear that where an output control is an appropriate management measure for a non-target fish species, the species should be managed within the QMS. The QMS provides a sophisticated set of economic disincentives that help restrict the catch of each fish stock to the relevant catch limit while providing some flexibility to help avoid closing fisheries unnecessarily. In contrast, the ability to manage output controls outside the QMS is poor. As discussed earlier, competitive catch limits promote poor fishing activities and, when the catch limit is exceeded, the resultant restrictions on the catching of that fish stock may result in the closure of fisheries in which the fish stock is taken as a by-catch. Note that decisions on whether to introduce a species to the QMS are made under s 18 of the Fisheries Act 1996.
- 75 The effects of fishing on some non-target species and habitats may be more cost-effectively managed using input controls and no output controls. Appropriate use of area-based method restrictions and fishery closures can provide the required level of protection for a particular habitat type and a wide range of non-target species that are found in that habitat—many of which we have very limited information about. Management of these species by output controls would require sufficient information to know that the catch limit is appropriate to ensure long-term viability. Obtaining this information for a large number of non-target species would be very expensive.
- 76 This Strategy is designed to provide a framework within which the effects of fishing on the aquatic environment can be managed in the most efficient manner. This means that, where practicable, stakeholders should be able to choose the most appropriate approach

to manage the effects of their fishing activities on the aquatic environment—provided the approach meets relevant standards and stakeholders meet the full costs associated with their activities. Therefore, establishment of clear standards setting out limits of acceptable effects of fishing on the aquatic environment is critical to the Strategy.

Part 3: Proposed Management Framework

FRAMEWORK

Outline

- 77 The management framework MFish proposes to use to manage the effects of fishing on the aquatic environment is set out in Figure 2. Key features of the framework include:
- The MFish Vision, and the Operating Principles that will guide management of the effects of fishing
 - Recognition of the importance of building our understanding of the structure and functioning of aquatic ecosystems, and the effects of fishing, to be used as the basis for setting environmental standards.
 - Separation of the roles of setting environmental standards and managing the effects of fishing. This approach is consistent with the broad approach adopted by MFish to use Government-set standards to determine requirements for fisheries management and provide increased opportunities for fisheries stakeholders to participate in managing fisheries within these standards. A range of factors relevant to setting environmental standards is identified.
 - Partnership with tangata whenua, participation by stakeholders and consultation with the public will be an important component of the management framework. It will occur—in different forms—at all stages of the standard-setting and management process.
 - Monitoring of the implementation and effectiveness of the Strategy will be vital for determining if the Strategy is having the intended effect.

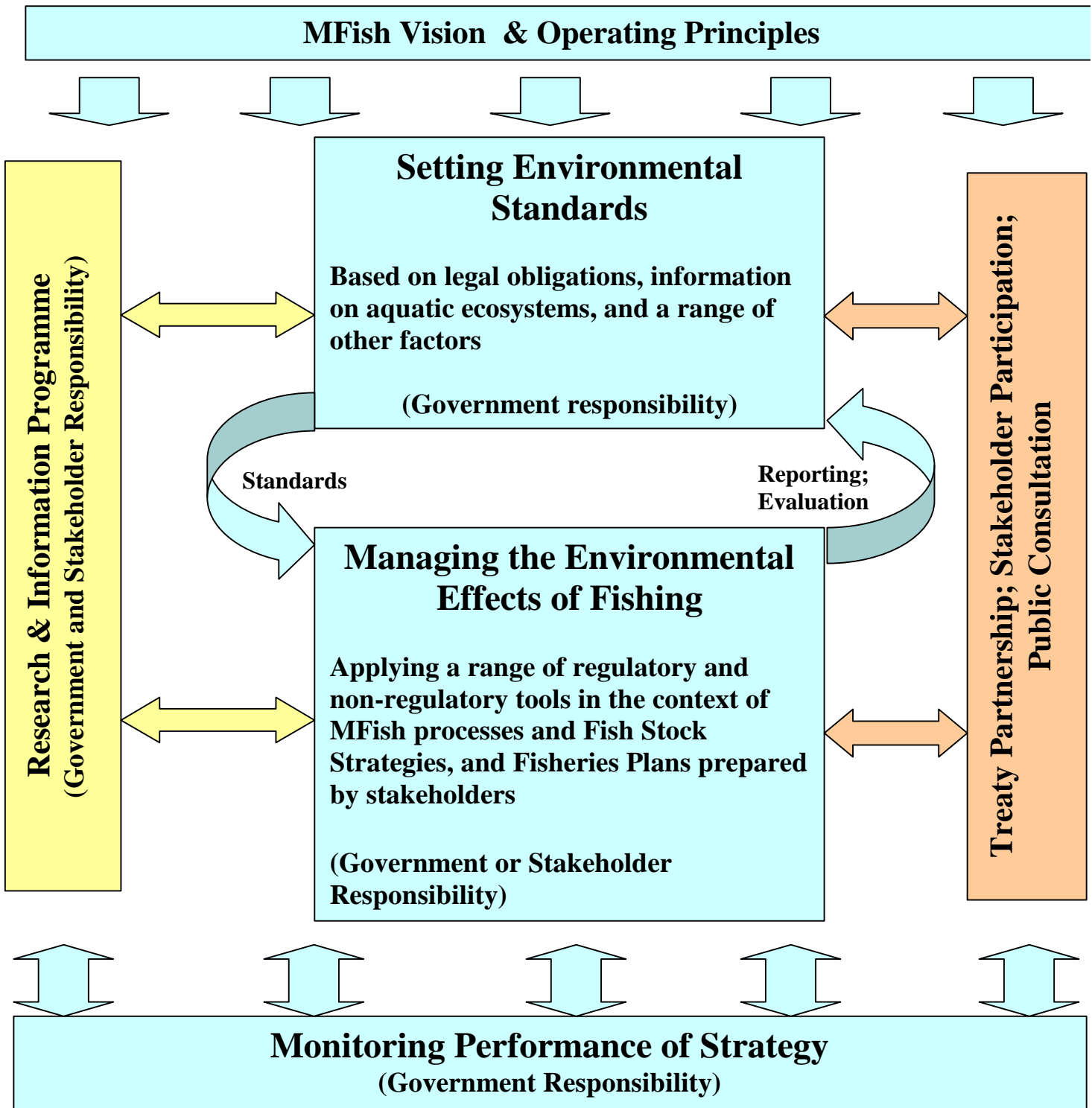
Each of these elements is described in subsequent sections.

Implementation of the Strategy

- 78 It is envisaged that once the proposed framework for managing effects of fishing is adopted, current fisheries management practices will be brought into line with the Strategy over a number of years. Three elements of the proposed framework are not part of current fisheries management: environmental standards, Fisheries Plans, and Fish Stock Strategies⁴. Development of generic standards applicable in all fisheries can be achieved in the short to medium-term, but completion of fishery-specific environmental standards for all fisheries will take longer. Similarly, there are currently no formal Fisheries Plans or Fish Stock Strategies in place and it will be some years before formal plans are completed for all fisheries. Plans will be required to demonstrate how the management proposed for a fishery meets generic and fisheries-specific environmental standards. In the meantime, MFish processes by which fisheries are managed will take into account whatever relevant environmental standards have been developed.

⁴ Section 11A of the Fisheries Act 1996 allows the Minister of Fisheries to approve a Fisheries Plan—normally expected to be prepared by those with an interest in a fishery—specifying how the fishery will be managed. MFish intends to use Fish Stock Strategies to document the management of fish stocks for which Fisheries Plans have not been prepared.

Figure 2. Framework for Managing the Environmental Effects of Fishing



MFISH VISION & OPERATING PRINCIPLES

Principles to Guide Management

- 79 The MFish Vision, and the Operating Principles in the Strategy provide both the context within which the environmental effects of fishing will be managed, and the management approach that will be adopted.
- 80 The MFish Vision—taken from the MFish Strategic Plan 2003–2008—describes MFish’s view of what fisheries and the aquatic environment should be like, and how people should interact with fisheries and the aquatic environment, and with others. The Vision will have a direct influence on the setting of environmental standards and should also influence the operation of other components of this Strategy framework. MFish acknowledges that achieving the Vision is in part dependent on management actions outside the scope of this Strategy.
- 81 The Vision could be achieved in different ways. The Operating Principles set out how MFish intends to achieve the Vision in areas related to the aquatic environment. They are intended to guide the actions of MFish and stakeholders, and provide stakeholders with greater certainty about the way MFish will approach management of the effects of fishing on the environment. The Vision and Operating Principles are applicable across all areas of this Strategy and inform all associated processes.

MFish Vision

- 82 The MFish Vision, taken from the MFish Strategic Plan 2003–2008, is set out below:
- New Zealanders’ attitudes towards the fishery are characterised by confidence and respect.
 - They have confidence in, and support, the way their fisheries and the aquatic environment are managed. They respect the rights of others who have a stake in the fishery and in the aquatic environment.
 - Our fisheries resources are used sustainably and the aquatic environment is well protected, contributing to the well-being of New Zealanders and their communities, and in particular:
 - A healthy aquatic environment that contributes to cultural, economic and social well-being
 - Customary Maori fisheries that contribute to the cultural health and well-being of iwi and hapu
 - High-quality recreational fisheries that contribute to the social, cultural and economic well-being of all New Zealanders
 - An internationally competitive and profitable seafood industry that makes a significant contribution to our economy.

- Fisheries resources and the aquatic environment are managed with care so future generations will continue to enjoy their many benefits.
- Our aquatic environment is healthy and the richness of our biodiversity is vigilantly maintained. Biosecurity risks are identified and avoided or managed.
- People with rights to use fisheries resources have responsibility, and are held accountable, for the management of those rights, within environmental limits and standards set by the government.
- They also meet the external environmental costs, and infrastructure costs, associated with their activities. Strong voluntary compliance with the rules and effective deterrence underpin the sustainable use of fisheries and protection of the aquatic environment.
- The Crown and Maori work in partnership to ensure the sustainable use of fisheries and protect the aquatic ecosystem. Similarly, the Crown works closely with environmental, recreational and commercial stakeholders to achieve this same goal.
- Those who use fisheries resources and the aquatic environment recognise and respect each other's rights, responsibilities and interests. They work together constructively to resolve issues.
- We work together to make the best decisions we can, using the best information and high-quality research and technologies.

Operating Principles

83 The following operating principles have been developed in the context of this Strategy.

General

- Management actions will endeavour to provide for utilisation of fisheries resources within constraints—including ensuring sustainability
- The Crown will work together with Maori recognising the Crown's obligations under the fisheries Deed of Settlement, individual iwi settlements, and the principles of the Treaty of Waitangi
- The Crown will work closely with environmental, recreational, commercial and other stakeholders to set environmental standards
- The approach to managing the effect of fishing on the environment will develop over time. A "learning culture" will support this progression.

Approach to Managing Effects of Fishing

- A proactive approach will be taken to managing the environmental effects of fishing
- Actions taken will be commensurate with the likely costs (including opportunity costs) of inaction
- Continuous improvement will be sought

- An adaptive approach will be taken, particularly where information is uncertain
- Roles, responsibilities and accountabilities will be clearly defined for all components of this Strategy
- The onus to demonstrate that the effects of a fishing activity are acceptable will be on those responsible for managing the activity

Standard setting

- Standards should be set to achieve the following:
 - Biodiversity is maintained and there have been no fishing-induced extinctions
 - The effects of fishing on aquatic ecosystems are within accepted limits
 - The effects of fishing on Protected Species allows these species to remain at or rebuild to appropriate levels
 - Representative areas of each type of habitat are protected
 - Habitat of particular significance for fisheries management is protected
- Standard setting will be informed by a wide range of inputs
- Best available information will be used
- Uncertainty will be considered; caution will be exercised where information is uncertain, unreliable or inadequate; uncertainty will not be used as a reason to delay necessary action
- Transparent processes will be used
- Compliance and enforcement costs will be considered
- Where practicable, standards will be designed to allow flexibility in the mechanisms by which the standard can be achieved, to encourage innovation and efficiency

PRIORITISING INFORMATION REQUIREMENTS

- 84 This Strategy proposes a shift in management approach from reacting to specific concerns about possible effects of fishing to a more planned approach to addressing the effects of fishing. Although the detailed research implications of this approach will be determined in conjunction with the Aquatic Environment Research Planning Group, it is clear that it will require greater emphasis on obtaining information on the structure, function and status of aquatic ecosystems on which to base environmental standards. The requirement for fishery managers to demonstrate that the effects of fishing activities are within agreed limits will result in the need for additional information on the effects of specific fishing activities on particular habitats and species. It will also probably lead to stakeholders seeking more information on harvest methods that cause fewer effects on aquatic ecosystems.
- 85 It is proposed that, wherever possible, existing or already proposed status reporting systems should be used. Thus, in respect of non-target catch, it is proposed that the Species Threat Status Classification System developed by DoC be used to assess the status of species. In respect of habitat protection, the preliminary draft of the Marine Protected Areas Strategy (currently under development) proposes an annual inventory of marine habitats and marine protected areas as a basis for prioritising future habitat protection initiatives. Elements of the Environmental Indicators Programme will also contribute to status reporting for both species and marine habitats. Research to support the establishment and operation of these assessment systems should be considered high priority.
- 86 Research on the indirect effects of fishing on aquatic ecosystems tends to be complex and expensive. It is proposed that New Zealand should undertake enough research in this area to ensure that major indirect effects can be identified and managed. However, the main focus of research in the short to medium term should be to obtain enough information to manage the direct effects of fishing.
- 87 Stronger links between management of the effects of fishing and research in this area need to be established—both to better direct scarce resources and to better utilise research results. Systems to facilitate better use of available information should be developed and used. The National Aquatic Biodiversity Information System, currently under development, will prove a valuable tool for this purpose.
- 88 More specific recommendations on research priorities are contained in Part 4 of the Strategy.

SETTING STANDARDS TO MANAGE THE EFFECTS OF FISHING

Background

- 89 This Strategy proposes that the government use environmental standards as a mechanism for establishing and implementing agreed limits to the effects of fishing on the aquatic environment. Currently, there are few explicit limits on the effects of fishing. Limits can be inferred from the numerous decisions the Minister of Fisheries has made to limit the effects of fishing, however, this provides little certainty to stakeholders about how the government will respond in any particular situation. The use of standards to limit the effects of fishing will provide greater transparency and should enhance the consistency of decision-making and provide stakeholders with greater certainty.
- 90 The proposal to use standards to manage the effects of fishing is consistent with other moves in New Zealand fisheries management. There is recognition in various international fisheries agreements that it is desirable for fishery stakeholders to be involved in the management of fishery resources. Potential benefits of such involvement include improved provision of information, more responsive management and improved stakeholder support for fishery management systems. Potential problems such as erosion of information quality, lack of stakeholder capability and capacity, capture of decision-making processes, and lack of resources for some fishery stakeholders to participate in management, must be guarded against.
- 91 Already, in New Zealand, an industry-owned company is responsible for the operation of the quota registry and related systems—to government-set standards, iwi are taking increased responsibility for management of customary Maori fishing, and MFish is developing mechanisms to implement provisions in the Fisheries Act that allow stakeholders to prepare Fisheries Plans to manage specific fisheries. Development and implementation of effective government-set standards are critical to all moves to give stakeholders increased opportunities to be involved in the management of fishery resources.
- 92 MFish proposes, in the first instance, establishing species-specific and habitat-specific environmental standards rather than fishery-specific standards. This is because many non-target species and aquatic habitats are affected by more than one fishery and may also be affected by non-fishing activities. Setting only fishery-specific standards could result in unacceptable effects on a particular species as a result of the cumulative effects of a number of fisheries and other factors.
- 93 This Strategy focuses on managing the effects of fishing. However, when setting species-specific environmental standards, non-fisheries effects need to be taken into account. Coordinated management of all effects on a species will require cooperation with other New Zealand agencies and, in the case of widely ranging species such as seabirds, with agencies in other countries too.
- 94 There are two important implications of this approach. The first is that management of each fishery will potentially need to meet standards relating to different species and habitats. Secondly, where different fisheries affect a particular non-target species or

habitat, the limit on the effect on that species or habitat will need to be shared by or allocated between the different fisheries. In some instances, this will require a high level of cooperation between the managers and participants in different fisheries.

- 95 It is expected that environmental standards relating to New Zealand flagged vessels fishing in international waters would normally be based on standards set by the relevant regional fisheries management organisation (RFMO). Where no relevant RFMO exists the responsible Minister may set environmental standards for New Zealand fishers. Where the environmental standards set by such an organisation are considered inadequate, the responsible Minister may set higher standards for New Zealand fishers, as appropriate.

Process and Performance Standards

- 96 Two types of environmental standards are proposed in this Strategy: process standards and performance standards.

Process Standards

- 97 Process standards will set out the requirements for the processes by which the effects of fishing on the aquatic environment are managed. Examples of the type of process standards that may be required include:

- Consultation requirements
- Data quality requirements
- Monitoring requirements
- Requirements for fishery environmental risk assessments
- Requirements for reporting the performance of fisheries management
- Protocols for modifying performance standards

- 98 MFish currently has a range of reasonably well-developed process standards but some of these are not clearly documented. Formal documentation of these standards will provide necessary guidance for MFish and stakeholders. Additional process standards are also required. Many process standards will be common to both management of the effects of fishing on the aquatic environment and management of fish stocks.

Performance Standards

- 99 Performance standards will establish the acceptable limits of the effects of a fishery on the aquatic environment. There is a wide range of possible types of performance standards applying to areas, populations, catch limits etc. They may be expressed in terms of a definite number e.g. the maximum allowable non-target species catch limit or the minimum area of a habitat type to be protected from the effects of fishing, or as a probability e.g. a minimum probability that a population is at a specified level or is rebuilding. They may be set on an annual basis or may be on a multi-year basis. The standards are intended as a formal expression of what the government expects in relation to limits on the effects of fishing on the aquatic environment. These standards

will be determined on the basis of a range of factors discussed in a later section. To encourage innovation and efficiency, standards will be designed to provide for maximum flexibility in how they can be achieved.

Standard-Setting Process

Prioritisation

- 100 The first steps in setting standards are to identify and prioritise processes, species and habitats for which standards are required. A range of methods is available to identify such species and habitats. These include:
- Identifying important processes for which standards are required e.g. standards for fishery environmental risk assessments
 - Identifying species and habitats for which specific management measures are already in place
 - Undertaking systematic risk assessments of all relevant species and habitats, including reviewing overseas information concerning similar species and habitats
 - Utilising information from the fishery-specific risk assessments that will be required for each fishery.

Setting Standards

- 101 Development of environmental standards requires careful consideration of a number of factors—discussed in the next section. Some of these factors cannot be maximised simultaneously and, therefore, when setting standards, trade-offs must be made. The responsibility for making those trade-offs and determining environmental standards lies with the Minister of Fisheries. However, there should be effective stakeholder input in the process of providing advice to Minister on setting standards. Such input will help ensure that stakeholder views are properly considered when environmental standards are set and that a broad range of possible options for standards is considered. Establishment of a new advisory group is proposed to facilitate such input (discussed in a later section).
- 102 It is proposed that environmental standards should be based, at least in part, on managing the level of risk to which species and habitats requiring specific management are exposed. Risk-based management approaches are common in many areas of natural resource management and, more recently, are being used in fisheries management. Risk is usually assessed in terms of the likelihood of an effect and the consequence of the effect. Initially, assessment of likelihood and consequence may be largely qualitative, but, over time, increased information should allow a move toward a more quantitative assessment.
- 103 It is proposed that environmental standards should require management actions and reporting appropriate to the level of risk. The higher the level of risk, the more immediate the management actions and the higher the level of reporting required. In keeping with the operating principle of continual improvement, it is proposed that for all risk levels of moderate and above, standards should require management measures to reduce the level of risk; the rate of reduction required will depend on the level of

risk. Work is required to determine thresholds between risk ratings and the nature of standards relating to the implementation of management measures to reduce risk rating. The amount and quality of information concerning both the likelihood and consequence of the effects is another important factor in risk management, especially since there is an obligation for decision makers to be cautious where information is uncertain, unreliable or inadequate.

- 104 The task of developing environmental standards will take a number of years and will be constrained, to some extent by the availability of information. It is proposed that priority should be given to developing generic standards applicable to a wide range of habitats and species. More specific standards should then be developed with priority being determined by factors including:
- Assessment of risk for the species or habitat
 - Availability of information
- 105 The problem posed by lack of species-specific or habitat-specific information can be overcome in part by initially setting standards at a more general level. For example, in respect of habitat management, standards would initially be set for broad habitat classifications and as habitat classification systems are refined, standards would be applied to more narrowly defined habitat types. Similarly, in respect of non-target catches, standards might initially apply to groups of related species and, over time, as more information becomes available, standards would be applied to individual species.

Implementing Environmental Standards

Existing Legislative Framework

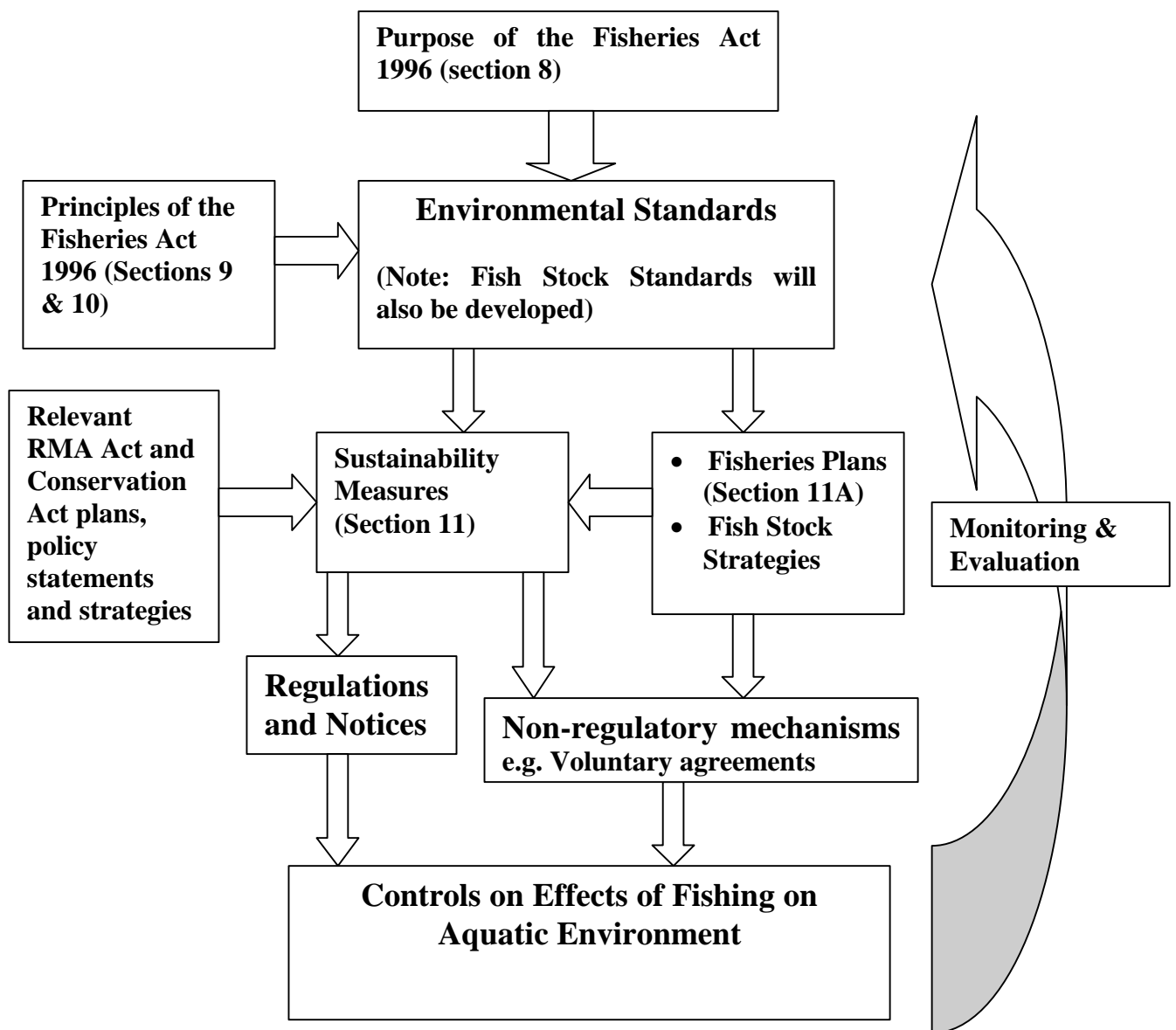
- 106 The key elements of this Strategy can be implemented without amending the Fisheries Act 1996. Under the existing legislative framework, it is proposed that environmental standards will be expressed in the form of policies describing how the Minister of Fisheries intends to give effect to the purpose and principles of the Fisheries Act 1996. As with any other policy of this nature, they will not bind the Minister to act in a specific way in every situation. Each situation will be considered to determine if there are any special circumstances indicating that the policies should not be followed in that particular situation.
- 107 The standards will set out the limits on the effects of fishing on the aquatic environment that the Minister considers consistent with the purpose and principles of the Act. The relationship between Environmental Standards and other components of the current fisheries management systems is shown in Figure 3.
- 108 It is proposed that environmental standards (and other relevant standards including fish stock management standards) will be given effect through sustainability measures, Fisheries Plans, and Fish Stock Strategies. Other inputs to the development of sustainability measures include relevant:
- Regional policy statements, regional plans or proposed regional plans under the Resource Management Act 1991
 - Management strategies or management plans under the Conservation Act 1987

- Sections 7 & 8 of the Hauraki Gulf Marine Park Act 2000
- Approved Fisheries Plans under Part 3 of the Fisheries Act 1996

109 The requirement to take into account these other processes means the Minister can assess the contribution these processes make to the achievement of the standards and implement sustainability measures that complement the other processes.

110 Sustainability measures can be implemented either through regulatory or non-regulatory mechanisms such as voluntary agreements. Monitoring and evaluation of the effectiveness of controls on the effects of fishing on the aquatic environment will inform future standard setting.

Figure 3. Existing Mechanisms for Implementing Environmental Standards



111 Section 15 of the Fisheries Act 1996 requires the Minister to take measures necessary either to implement relevant parts of a Population Management Plan or otherwise avoid, remedy or mitigate any adverse effects of fishing on protected species. The measures in this section are similar in effect to the sustainability measures in Section 11.

Managing the Effects of Fishing

Fisheries Management Role

112 The Strategy proposes that either the government or stakeholders could take the lead in managing fisheries to achieve environmental standards. Currently, MFish takes the lead role in managing most New Zealand fisheries. Stakeholder groups representing extractive users have been of the view that, despite their desire to take greater responsibility for fisheries management, there have been too many barriers to them achieving this. However, a 1999 amendment to the Fisheries Act 1996 allows the Minister of Fisheries to give formal approval for stakeholder-prepared Fisheries Plans, thereby providing a new mechanism for stakeholders to take increased responsibility for management. Some stakeholder groups are currently developing Fisheries Plans.

113 Section 11A of the Fisheries Act 1996 and the Fisheries Plans Framework are non-prescriptive in respect of how a Fisheries Plan should be developed and implemented. For the purposes of this Strategy, what is critical is that the management approach and rules developed within the Plan must meet the environmental standards—both performance standards and process standards—and that they must be implemented in a manner that allows the effectiveness of the measures to be verified. Non-performance against standards would result in sanctions being applied.

114 Where stakeholders do not prepare Fisheries Plans, MFish will continue to take the lead in all aspects of managing a fishery. MFish intends to develop Fish Stock Strategies as the vehicle for its management. Both stakeholder-developed Fisheries Plans and MFish-developed Fish Stock Strategies will be required to meet relevant fish stock management standards and environmental standards.

115 Under the proposed framework, reporting on fisheries management performance will need to be adequate to enable MFish to assess the performance of the fisheries management system against standards—both process standards and environmental performance standards. Reporting standards will be developed.

Evaluating Fisheries Management Performance

116 An important component of using environmental standards to manage the effects of fishing on the aquatic ecosystem is the evaluation of fisheries management performance against the standards. MFish is currently completing an organisational redesign intended to provide a clearer focus on the organisation's primary role of fisheries management. A standards unit—responsible for setting fishery management standards and environmental standards—has been established as part of this redesign. This group will also be responsible for evaluating the performance of Fisheries Plans and Fish Stock Strategies in meeting these standards.

- 117 The standard-setting and evaluation unit will operate as a distinct entity within the Fisheries Management Business Group of MFish and will be responsible for evaluating the fisheries management efforts of both stakeholders and MFish. The separation of the standard-setting and evaluation role from the fisheries management role is important to help ensure the same standards are applied to fisheries management led by both MFish and stakeholders.
- 118 Sanctions for non-performance against environmental standards will be required. There is a wide range of possible types of sanctions appropriate to the New Zealand fisheries management system in general and the specific fishery and Fishery Plan or Fish Stock Strategy in particular. Possibilities include monetary penalties, reductions in target stock TACs, loss of bonds, and ultimately reversion of management to the Government. Not all of these sanctions are currently available in relevant legislation. The Oceans Policy project will also be addressing this issue.

Fishery Environmental Risk Assessment

- 119 A key change proposed in this Strategy is that an assessment of the risks posed to the aquatic environment by a fishery will be required for each fishery. The requirement to undertake an environmental impact assessment is not new in New Zealand and is increasingly common in fisheries management. Such assessments are also common in land-based resource management. In Australia, the environmental effects of a fishery must be assessed to be within specified standards before exports from a fishery are permitted. In New Zealand, the requirement to assess the possible environmental effects of a fishery has recently become a required component of Adaptive Management Proposals. Such an assessment is also a requirement imposed in the recent certification of the New Zealand Hoki Fishery in the Marine Stewardship Council (MSC) Certification Programme.
- 120 It is proposed that fishery risk assessments would normally be undertaken as part of the development of a Fisheries Plan or Fish Stock Strategy. The assessment will identify the species and habitats that the fishery may affect and help to identify the environmental standards applicable to the fishery.
- 121 Development of process standards for the fishery environmental risk assessment should be given high priority. The required assessment should be appropriate to the scale of the fishery. It is proposed that new fisheries or proposals to expand fisheries would be subject to the requirement to undertake an environmental risk assessment immediately while other fisheries would be required to undertake a risk assessment within a specified period—currently proposed as 2007.

Proposed Actions: Standard Setting

MFish will:

- Appoint staff to new positions in the MFish Fisheries Management Group with a focus on setting environmental standards and evaluating fishery management initiatives against those standards (2002, 2003; under way)
- Appoint staff to new positions in the MFish Science Team, including a Science Manager—Aquatic Environment, to support the development of environmental standards and provide scientific advice on the management of the effects of fishing on the aquatic environment (2002, 2003; under way)
- Develop standards for assessing the environmental risks posed by a fishery (2003/04).
- Develop generic performance standards for managing the effects of fishing on the aquatic environment (2002–2004; under way)
- Develop process standards for major processes associated with management of the effects of fishing on the aquatic environment (2003/04)
- Require an assessment of the environmental risks posed by a fishery to be completed for new or developing fisheries prior to development of the fishery (2004) and for existing fisheries (2007).
- Develop standards for reporting fisheries management performance against environmental standards (2003–2005)
- Develop and implement sanctions for non-performance against environmental standards (2003–2005)

FACTORS IN SETTING ENVIRONMENTAL STANDARDS

Range of factors

122 This Strategy proposes explicit recognition of a broader range of factors in setting environmental standards setting than currently occurs. The basis for any environmental standard is information on the structure and function of aquatic ecosystems and the effects of fishing. However, to determine the appropriate level at which to set a standard, this information must be considered in light of other factors. Guidance is provided by the Vision and Operational Principles set out earlier in this Strategy. Other factors relevant to setting standards include:

- Environmental obligations
- Treaty considerations
- Societal expectations
- Utilisation considerations
- Compliance and incentives
- Evaluation of the performance of Fish Stock Strategies and Fisheries Plans against existing environmental standards

Each of these factors is described in the remainder of this section.

Environmental Obligations

123 New Zealand has a wide range of fisheries-related environmental obligations. Most are based on international agreements and conventions to which New Zealand is a signatory and are given effect through domestic legislation. Management of the effects of fishing on the aquatic environment is a rapidly developing field driven by factors including advances in scientific techniques, increased availability of information, and changing societal attitudes. New Zealand participates in the development of all significant new international agreements affecting management of the effects of fishing and endeavours to implement new agreements promptly through domestic legislation.

International Agreements

124 New Zealand is a signatory or party to a number of international agreements containing fisheries-related obligations. Section 5 of the Fisheries Act requires that the Act to be interpreted in a manner consistent with these obligations. Copies of most fisheries-related international conventions and agreements, and information on the status of these instruments, can be found on the website www.oceanlaw.net operated by the United Nations.

125 The Fisheries Act 1996 was designed to be consistent with New Zealand's international obligations relating to fishing and Section 5 requires that the Act be interpreted in this manner. In light of the rapid development of international instruments relating to

management of the environmental effects of fishing, it is proposed that a periodic review of international obligations should be undertaken.

Fisheries Act 1996

126 The main environmental obligations for which MFish is responsible are set out in the Fisheries Act 1996. Most important among these are:

- Interpretation (s5). Requires that the Act be interpreted in a manner consistent with New Zealand's international fisheries obligations and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992
- Purpose (s8). Defines the purpose of the Act: *To provide for the utilisation of fisheries resources while ensuring sustainability*, and defines *sustainability and utilisation*. Critical to this Strategy is the definition of *ensuring sustainability*, which includes *avoiding, remedying, or mitigating the adverse effects of fishing on the aquatic environment*⁵. Effect is defined to include temporary and permanent effects, cumulative effects, and potential effects of low probability which have a high potential impact. A purpose statement does not, of itself, require action, but provides a guide for interpreting other sections of the Act, and may convey the broader objectives that the Act is intended to achieve.
- Environmental principles (s9). These cover: viability of Associated or Dependent Species; maintenance of aquatic biological diversity; protection of habitat of particular significance for fisheries management.
- Information principles (s10). Requires use of best available information; consideration of uncertainty; caution where information is uncertain, unreliable or inadequate; uncertainty not to be used as a reason to delay action.
- Sustainability measures (Part 3). Provides for the setting and varying of Total Allowable Catches and sustainability measures for fish stocks and steps necessary to manage fishing-related mortalities on Protected Species

127 MFish has prepared policy definitions for most sections in Parts 2 and 3 of the Fisheries Act, including all the sections related to environmental obligations. These are available from the MFish website (www.fish.govt.nz).

Other New Zealand Instruments

128 Environmental obligations relevant to management of fisheries are also contained in other New Zealand legislation and strategies. These include:

- New Zealand Biodiversity Strategy. Is the means by which New Zealand gives effect to the Convention on Biological Diversity (1992). MFish is the lead agency in respect of marine biodiversity. Desired outcomes for 2020 in respect of marine biodiversity cover: maintenance of natural marine habitats and ecosystems;

⁵ There are different interpretations of the term, *Avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment* and whether any hierarchy between the alternative actions is intended. These issues are discussed in the MFish Policy Definition for section 8, available on the MFish Website (www.fish.govt.nz). In this Strategy, the term *managing (the effects of fishing...)* incorporates *avoiding, remedying or mitigating* (any adverse effects of fishing...).

protection of rare and threatened species; appreciation of marine biodiversity and effective biosecurity.

- Marine Mammals Protection Act 1978
- Wildlife Act 1953. Provides for protection of marine wildlife including seabirds, turtles, corals and spotted grouper
- Antarctic Marine Living Resources Act 1981. Gives effect to the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)

Treaty Considerations

- 129 Section 5 of the Fisheries Act 1996 requires the Act to be interpreted in a manner consistent with the Treaty of Waitangi. Consistent with this requirement, the views of tangata whenua on management of the effects of fishing will be taken into account when determining environmental standards.
- 130 The MFish Treaty Strategy, currently under development, will establish a number of Regional Iwi Forums and regionally based Treaty Coordinator positions. These are designed to build effective relationships between MFish and iwi and hapu and facilitate Maori input to all fisheries management processes. The networks established through the Treaty Strategy will enhance Maori input to the setting of standards to manage the effects of fishing on the aquatic environment.

Societal Values

- 131 Fishery participants should be aware that, where appropriate, government-set standards for management of the effects of fishing on the aquatic environment will incorporate tangata whenua values and other societal values—in addition to scientific information on minimum levels to ensure viability.
- 132 The Fisheries Act 1996 provides the Minister of Fisheries with some discretion when setting sustainability measures related to the effects of fishing. In general, the Act provides minimum standards that must be met—such as maintaining species above levels that ensure viability, and maintaining biological diversity—but allows the Minister to impose standards beyond these minimums. For example, in both s15(1) and s15(2) of the Act, management measures may go beyond those required to ensure that the Protected Species remains above a viable level. The Minister may choose to impose measures that further reduce the effects of fishing to avoid unnecessary mortalities or to increase the rate of recovery of a depleted species. The Minister also has discretion when determining how to give effect to the requirement to ensure biological diversity is maintained and when determining how to maintain the potential of fisheries resources to meet the reasonably foreseeable needs of future generations.
- 133 It is apparent that societal expectations concerning protection of icon species and protection of aquatic habitat are increasing. Expectations are often higher than, for example, the requirement to maintain a Protected Species at viable levels. There is an expectation that, at a minimum, all reasonable steps are being taken to avoid the effects on Protected Species. Of interest is that consumers of New Zealand seafood in some of our key markets—notably North America and Europe—typically have higher expectations concerning the management of the effects of fishing than those held by

many New Zealanders. This adds a commercial incentive for higher environmental standards.

Utilisation Considerations

- 134 The Fisheries Act is a “utilisation” statute and reflects the intention that fisheries resources be utilised. Utilisation in the context of the Fisheries Act means conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic and cultural well-being. There is no guidance in the Act as to what constitutes social, cultural, and economic well-being or the test by which it can be ascertained that well-being is being provided for. There is no absolute requirement for decision makers to ensure that the well-being of people does result. Rather, the Act is explicit that the obligation of decision makers is to enable people to provide for their well-being. Whenever possible, people should be free to determine how they wish to provide for their own well-being. Clearly, utilisation must be taken into account when setting environmental standards.
- 135 There is discretion available to decision makers as to the extent to which aquatic resources are managed above the environmental thresholds or bottom lines set out in section 9 of the Act. In order that due recognition is given to the requirement to provide for utilisation, the choice of methods adopted to ensure sustainability should also require consideration of the consequences of each option in terms of the ability to provide for utilisation of fisheries resources—including an assessment of the costs of implementing the option. Similarly, when considering whether to set a standards at a level higher than the minimum required to ensure sustainability, the requirement to provide for utilisation must be carefully balanced with the benefits likely to result from setting a standard at a level above the sustainability threshold.

Compliance and Incentives

- 136 Compliance issues are critical when developing environmental standards. If a standard is difficult to implement and enforce, it is unlikely to contribute significantly to maintaining the quality of the aquatic environment. It may also be unnecessarily expensive and so reduce the value of utilising fisheries resources. A fishery manager must be able to demonstrate that the fishery meets a standard to an acceptable level in order to demonstrate that the effects of fishing are within acceptable limits. For example, if a standard relates to a maximum allowable non-target catch limit, it may be difficult to demonstrate that the limit is not being breached without a high level of observer coverage. Similarly, it may be difficult to demonstrate that fishers are keeping out of a closed area distant from land if relevant vessels do not utilise an approved vessel monitoring system and there is no observer on board. Consideration of a wide range of compliance factors, including the costs of compliance, must be undertaken at an early stage of developing environmental standards.
- 137 Closely related to issues of compliance are the incentives available to encourage fishery users to comply with management measures. The level of compliance with a particular measures depends on a range of incentives. These include potential disincentives such as fines for non-compliance or payment of fees for breaching specific levels of effect on

the aquatic environment, and incentives for compliance such as reduced costs (due to lower level of required services) and improved prices for products (through certification programmes).

Learning from Experience

- 138 The performance of fisheries against environmental standards will prove a valuable input to the development of new environmental standards. Development and enforcement of environmental standards for fisheries is a largely new field in fisheries management and, consequently, there is little experience on which to base new environmental standards. As indicated earlier, it is expected that environmental standards, Fish Stock Strategies and Fisheries Plans will be developed over a number of years. Experience from the implementation of initial standards and plans will be important for refining existing standards and preparing new standards.

Proposed Actions: Factors in Setting Environmental Standards

MFish will:

- review international fisheries-related environmental obligations and domestic instruments to ensure New Zealand is meeting relevant obligations (2004 and thereafter on a 5-yearly basis)
- review proposed domestic legislation to ensure it is consistent with international fisheries-related environmental obligations (ongoing)
- commission research to better understand tangata whenua values and other societal values relating to management of the effects of fishing on the aquatic environment (2004; ongoing)

PARTNERSHIP, PARTICIPATION AND CONSULTATION

Current Situation

- 139 MFish consults extensively with stakeholder groups on all sustainability issues—including management of the effects of fishing—but there are concerns about some aspects of its consultation.
- Stakeholder groups have expressed concern about having to read large amounts of technical information in a short time, the lack of financial support for them to participate in consultation processes, and that issues they have raised have not been given due consideration by MFish
 - There is lack of information about where stakeholders should take concerns about the effects of fishing on the aquatic environment and aquatic environment issues do not appear to have high priority in the annual sustainability measures round
 - Maori are concerned that the existing consultation processes do not appropriately reflect the partnership relationship between Maori and the Crown
 - There are also concerns that MFish does not proactively consult with the general public
- 140 When developing advice to the Minister of Fisheries on proposed aquatic environment research projects MFish consults with the Aquatic Environment Research Planning Group. This Group comprises research providers, government officials and stakeholder representatives with an interest in aquatic environment research. The Aquatic Environment Working Group, comprising a similar membership, reviews research results and provides recommendations to MFish based on the research. Currently there is no group charged with advising MFish on managing the effects of fishing on the aquatic environment.
- 141 MFish is currently developing a Treaty of Waitangi Strategy for how the Ministry delivers on its obligations arising from the 1992 fisheries settlement and the principles of the Treaty. The Treaty Strategy project is focused on the establishment of strong working relationships and structures at a regional level that provide for face to face engagement between MFish and iwi/hapu fisheries representatives on fisheries issues, as well as the necessary capacity building and training to ensure that engagement is meaningful.

Proposed Consultation on Environmental Management

- 142 In implementing this Strategy, a key aim is to provide for effective involvement from all interested parties. The Strategy has been developed in a collaborative way, with involvement from some key stakeholder groups. MFish intends to continue this approach. Potential benefits of more effective participation include:
- improved information on aquatic ecosystems and fisheries effects
 - better understanding of societal and tangata whenua views
 - identification of a broader range of possible management approaches

- development of more appropriate and effective environmental standards
 - improved understanding of and support for, the way the effects of fishing are managed
- 143 It is proposed that the Aquatic Environment Research Planning Group and Aquatic Environment Working Group will continue to provide advice to MFish on identification and prioritisation of research projects and on the results of this research. The Iwi Regional Forums proposed as part of the MFish Treaty Strategy will provide for more effective input and participation by iwi into the management of the environmental effects of fishing.
- 144 The Strategy proposes the establishment of a new Aquatic Environment Management Advisory Group to facilitate stakeholder involvement in setting environmental standards. The group would be coordinated by the Fisheries Management Business of MFish and would comprise representatives of tangata whenua, fishery and aquatic environment stakeholders, and officials from MFish and other government departments with an involvement in the management of the effects of fishing on the aquatic environment. Its purpose would be to advise MFish on managing the effects of fishing on the aquatic environment. An important task for this group would be to advise MFish on the establishment of environmental standards. Table 4 shows the groups by which it is proposed more effective stakeholder participation in managing the effects of fishing on the aquatic environment will be achieved.
- 145 MFish does not currently have funding to support stakeholder participation in its regular consultation processes, although some funding has been provided to support involvement in specific projects. There is no indication that this situation is likely to change. The use of standards to specify how the environmental effects of fishing should be managed may allow stakeholders to focus their involvement on the standard setting process rather than being involved in all aspects of the fisheries management process.
- 146 MFish does not have funding to undertake large-scale public consultation exercises in association with the implementation of this Strategy. However, it is important that interested members of the public have an opportunity to provide input to management of the environmental effects of fishing. MFish proposes to provide for public input in both the initial implementation of this Strategy and the ongoing management of the effects of fishing.
- 147 Different initiatives will be used to provide opportunities for additional public input to the ongoing management of the environmental effects of fishing, in addition to the proposed establishment of a working group. Consistent with Government's increasing focus on E-Government, greater use will be made of the MFish website (www.fish.govt.nz) to keep people informed about what is happening and provide access to key papers. Major papers on proposed sustainability measures are routinely distributed to stakeholder groups on CD-ROMs. It may be appropriate to distribute these CD-ROMs more widely.

Table 3. Existing and Proposed Groups to Facilitate Stakeholder Input to Management of the Effects of Fishing on the Aquatic Environment

Group	Membership	Function
Aquatic Environment Research Planning Group (existing)	Open to representatives of all fishery stakeholder groups; tangata whenua; research providers; officials from relevant departments. Facilitated by MFish Science Group	To advise MFish on the identification and prioritisation of research requirements related to managing the environmental effects of fishing
Aquatic Environment Working Group (existing)	(As above)	To review the results of aquatic environment research and advise MFish on the results
Aquatic Environment Management Advisory Group (proposed)	Open to representatives of all stakeholder groups, tangata whenua; officials from relevant departments (To be facilitated by MFish Fisheries Management Group)	To advise MFish on the development of environmental standards
MFish Regional Iwi Forums (9) (Currently being established as a result of the MFish Treaty Strategy)	Open to representatives of all iwi in the area covered by the forum (To be facilitated by the MFish Fisheries Management Group)	To provide input to all MFish sustainability measures processes—including managing the environmental effects of fishing.

148 The nature of stakeholder involvement in managing effects of fishing (as opposed to setting environmental standards) will depend in part on whether there is an approved Fisheries Plan in place for a fishery. Where there is no approved Fisheries Plan, MFish will take the lead in managing a fishery and interested parties will have opportunities to be involved in management processes in much the same manner as currently occurs. As in the existing framework, there will be opportunities for stakeholders to identify innovative fishery management measures to achieve environmental standards, although the scope for such innovation would be less than in the context of a Fisheries Plan.

149 Where there is an approved Fisheries Plan in place, decisions will be taken in accordance with the rules in the plan for those aspects of the fishery dealt with in the Plan. The preparation of Fisheries Plans will provide opportunities for interested parties to participate in developing a strategy for the fishery. Before approving a Fisheries Plan, the Minister of Fisheries will need to satisfy him or herself that interested parties have been consulted and that their views have been given appropriate consideration. The proponents of the Plan will, therefore, have a clear incentive to encourage interested parties to participate in the development of the Plan from an early stage.

Proposed Actions: Partnership

MFish will:

- Establish an Aquatic Environment Management Advisory Group as a forum for stakeholder input to setting environmental standards (2003, 2004)

MONITORING AND REVIEW

150 Monitoring and periodic review of the Strategy is required to ensure it is effective and remains relevant. Monitoring and review of the Strategy is distinct from the regular monitoring and evaluation of fishery management performance against environmental standards—discussed in an earlier section of the Strategy. Different types of monitoring are required to assess whether the Strategy is being implemented and whether it is effective.

Monitoring Implementation of the Strategy

151 It is important to assess the extent to which the Strategy is being implemented, before determining whether it is effective. An assessment of its implementation would be based around whether the actions identified in the Strategy have been undertaken within the proposed timeframe. MFish will undertake this task on an annual basis through its normal business planning and monitoring processes.

Monitoring the Effectiveness of the Strategy

152 The effectiveness of the Strategy can be assessed at two levels: how well the effects of fishing are managed, and the state of the aquatic environment. The advantage of using management of the effects of fishing as a measure of the Strategy's effectiveness is that it measures something that is largely within the control of the fisheries management regime. The disadvantage is that, while the effects of fishing on their own may be acceptable, the combined effect of fishing and non-fishing effects e.g. sedimentation and land-based pollution, on a species or habitat may be unacceptable.

153 Management of the effects of fishing can be assessed using measures such as:

- Number of species and types of aquatic habitat affected by fishing for which information is being collected
- Number of species and types of aquatic habitat affected by fishing for which fisheries management standards have been set
- Number of species and types of aquatic habitat about which we are confident that the effects of fishing are within agreed limits
- Level of tangata whenua, stakeholder and public satisfaction with the partnership, participation and consultation opportunities provided in the process of managing the environmental effects of fishing

154 It is proposed that measures of effectiveness be developed as part of the implementation of this Strategy. Where possible, measures should be based on information that is already collected. There are already a number of monitoring mechanisms measures designed to assess the state of the aquatic environment that are either currently in use or are planned to be implemented. These include:

- Environmental Performance Indicators
- Marine Protected Areas Strategy annual inventory of protected habitat

- Species threat classification system

155 It is proposed that, in the first instance, full implementation of currently proposed monitoring programmes such as those listed above should be considered a higher priority than development of additional monitoring programmes. MFish will utilise these monitoring programmes to assess the state of the aquatic environment and to provide an indication of the success of the overall success of this Strategy. Depending on the effectiveness of these monitoring mechanisms, others will be developed, as required.

Proposed Actions: Monitoring and Review

MFish will:

- Review the implementation of actions contained in this Strategy (3-yearly)
- Utilise existing programmes to monitor the state of the aquatic environment and management of the effects of fishing (ongoing)
- Determine whether additional monitoring mechanisms are required (2005)

Part 4: Managing Effects of Fishing on Parts of the Aquatic Environment

OVERVIEW

- 156 The inter-connectedness of the aquatic environment means that efforts to incorporate further ecosystem considerations into fisheries management require a holistic approach. However, implementation of any strategy requires some structure and grouping of tasks within the overall approach. As indicated in an earlier section, in this Strategy tasks have been grouped into three specific areas primarily based on the environmental obligations contained in the Fisheries Act 1996. They are:
- Managing the effects of fishing on non-target species
 - Managing the effects of fishing on aquatic habitats
 - Managing indirect effects of fishing on aquatic ecosystems
- 157 Currently the first two specific areas are, for the most part, managed using different tools. Effects of fishing on non-target species are managed primarily through the requirement to use non-target catch mitigation mechanisms and limits on the levels of non-target catch. Effects on aquatic habitats are generally managed through the use of area closures and area-based method restrictions. As management of the effects on non-target catch broadens from a focus on icon non-target species to a wider range of Associated or Dependent Species there is likely to be an increased use of closed areas and area-based method restrictions in this area and the distinction between the two areas may be diminished.
- 158 Managing the indirect effects of fishing has been identified as a separate area to emphasise its importance and in light of the different approaches necessary to address relevant issues. Over time, as consideration of indirect effects of fishing becomes accepted as part of regular fisheries management, it may be unnecessary to consider it as a separate area.
- 159 In this part of the Strategy, proposed management of in each of the specific areas is described.

MANAGING THE EFFECTS OF FISHING ON NON-TARGET SPECIES

Introduction

160 Obligations in respect of non-target species apply to a large number of species. Currently the adverse effects of fishing on only a small proportion of these species are considered explicitly. It is proposed that management of the effects of fishing on non-target species should be modified by:

- Broadening the range of species for which there is consideration of the adverse effects of fishing
- Assessing the threat status of a broad range of non-target species
- Obtaining additional information on a broader range of non-target species
- Setting standards to limit the effects of fishing on a broader range of non-target fishing

Species Status Assessment and Reporting

161 An important element of both setting standards to manage the effects of fishing and managing those effects is the assessment of the status of species that may be affected by fishing. DoC has recently developed a species threat classification system arguably more suited to New Zealand than the IUCN classification scheme⁶. The classification system uses seven different levels of threat ranging from nationally critical (more than 80% decline predicted within 10 years) to range restricted (threat based only on the fact that the species has a limited range). DoC is intending to update the species threat classification system on a three-yearly basis, with more frequent updates for individual species where new information becomes available and a change in status is indicated.

162 In respect of the marine environment, the system has been applied to Protected Species and a few marine invertebrates. It is proposed that the species threat classification system should be applied to a wider range of Associated or Dependent Species or groups of species affected by fisheries. This would be consistent with Actions (a) and (b) of Objective 3.7 of the New Zealand Biodiversity Strategy, *viz.*

(a) Review the threatened species priority setting systems and extend them to assess coastal marine species.

(b) Identify and protect species and their key habitats

163 The large number of Associated or Dependent Species means that it will take some time to complete the classification exercise. For many species there is likely to be limited information available, but even highlighting the lack of available information is an important step in managing the potential effects of fishing. As indicated earlier, initial assessment may be undertaken for groups of species. Research on these species is often expensive and, therefore, prioritisation of research efforts is important.

⁶ The IUCN system is based on continental scale range criteria and results in a high proportion of New Zealand species being classified as highly threatened as a consequence of New Zealand's relatively small size.

- 164 Classifying Associated or Dependent Species in terms of threat status will allow fisheries management responses for species affected by fishing—defined by way of environmental standards—to be matched to the relevant level of threat.
- 165 The species threat classification system is based on individual species (and possibly groups of species) and will not directly address the need to consider the risks posed to specific aquatic ecosystems by fishing. Identification of species for which there is a high threat status will provide some indication of potentially vulnerable ecosystems, but the primary protection for ecosystems will be provided through direct habitat protection measures.

Setting Environmental Standards

- 166 It is proposed that MFish, in association with DoC where appropriate, will increase the number of Associated or Dependent Species and Protected Species for which standards are developed to manage the effects of fishing. These standards will help ensure that these species are maintained above a level that ensures their long-term viability. To the extent possible, standards should allow flexibility in the manner in which the standards will be achieved.

Fisheries Management

- 167 Those undertaking management functions for a fishery will be required to meet the relevant government-set process and performance standards relevant for the fishery. A key step will be undertaking an assessment of the risks posed by a fishery. In respect of non-target species, the effect of the fishery on all relevant Protected Species and other Associated or Dependent Species will need to be assessed. Where particular standards have been set in respect of specific species the stock management plan or fish plan will need to meet those standards. Where there are no species-specific standards, there will be a requirement to meet generic standards and to take reasonable steps to mitigate the effects of the fishery on that species.
- 168 The current paucity of information on many Associated or Dependent Species means that it may be difficult for fishery managers to demonstrate that the fishery is allowing these species to be maintained above viable levels. Fishery managers may be faced with the choice of undertaking extensive research on a wide range of Associated or Dependent Species to demonstrate that the effects of the fishery on these species are within acceptable limits, or setting aside adequate areas as no-fishing or restricted fishing zones to ensure the viability of the species. Such a choice should be informed by the requirement to meet clear environmental standards and the requirement for stakeholders to face the full costs associated with their fishing activities.

Research Priorities

- 169 In respect of non-target catch species, it is proposed that research should focus on three key areas:
- obtaining sufficient information on Associated or Dependent Species and Protected Species to allow each species or groups of species affected by fishing to be classified in the species threat classification system

- obtaining information to allow specific performance standards to be set in respect of species affected by fishing that are classified as having a high threat status (declining, and vulnerable to extinction)
- research on mitigation methods

Proposed Actions: Non-target Species

In respect of the species threat classification system, MFish will:

- Extend the species threat classification system to cover additional Associated or Dependent Species (2003–2008; research proposal submitted)
- Re-assess Associated or Dependent Species within the threat classification system on a 5-yearly basis; re-assess individual species sooner where significant new information becomes available (ongoing)

In respect of research priorities, MFish will treat as a high priority:

- obtaining sufficient information on Associated or Dependent Species affected by fishing and Protected Species affected by fishing to allow a species threat classification to be undertaken (2003; ongoing)
- obtaining sufficient information on species with a high threat status to enable specific standards to be set (2003; ongoing)
- Assess the part habitat protection will play in maintaining Associated or Dependent Species at or above viable levels (2003–2005)

In respect of environmental standards, MFish will develop:

- standards for the processes by which the effects of fishing on Associated or Dependent Species and Protected Species, should be managed (2003–2005)
- performance standards determining acceptable effects of fishing on specific Associated or Dependent Species and Protected Species (2003; ongoing)

MANAGING THE EFFECTS OF FISHING ON AQUATIC HABITATS

Proposed Management

- 170 In many countries there are moves towards increased spatial management of the aquatic environment. This approach is consistent with the Oceans Policy currently under development and is not inconsistent with management in the context of the QMS. Spatial management may increase the number of areas from which different types of fishing is excluded or subject to additional controls but would also confirm that for many areas fishing is an appropriate use.
- 171 In New Zealand, there are a number of spatially-based controls that impact on management of the effects of fishing on the aquatic environment—both under the Fisheries Act 1996 and other legislation. Fisheries Act controls include:
- Method restrictions
 - Fisheries closures
 - Taiapure
 - Mataitai
- 172 Controls under other legislation include:
- Marine Reserves
 - Maritime Parks
 - Cable exclusion zones
- 173 All of these controls have the potential to contribute to the protection of aquatic habitat. Additionally, there are also voluntary agreements and codes of practice that contribute to habitat protection.
- 174 It is proposed that spatially-based controls should be used in a more coordinated manner to manage the effects of fishing on the aquatic environment. An important part of this approach will be provided through the proposed Marine Protected Areas Strategy.

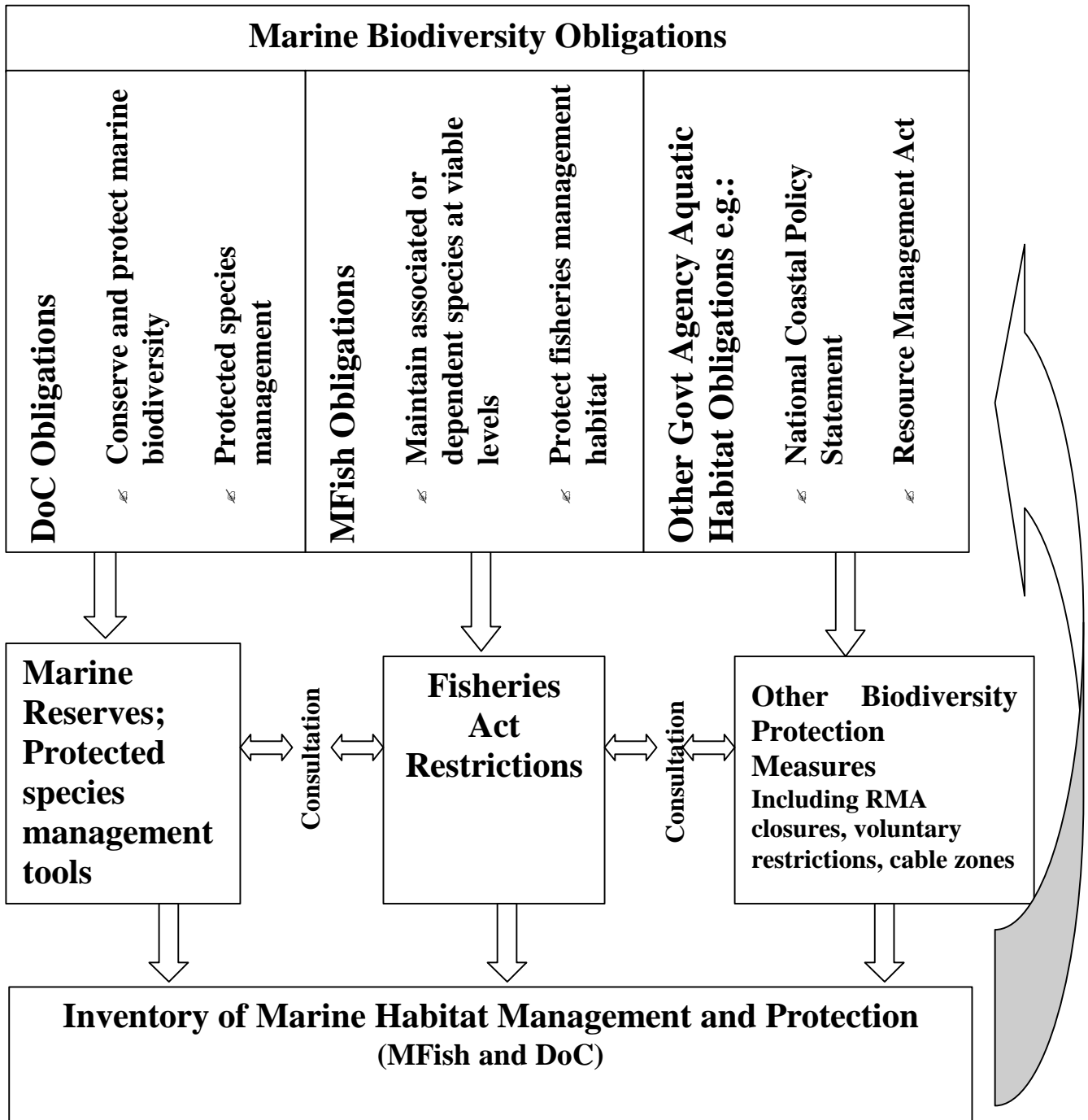
Marine Protected Area Strategy

- 175 MFish, DoC and the Ministry for the Environment are currently preparing the Marine Protected Area (MPA) Strategy to fulfill Action (a) of Objective 3.6 of the New Zealand Biodiversity Strategy, viz.

Develop and implement a strategy for establishing a network of areas that protect marine biodiversity, including marine reserves, world heritage sites, and other coastal and marine management tools such as mātaitai and taiapure areas, marine area closures, seasonal closures and area closures to certain fishing methods.

176 The MPA Strategy will provide the means by which government coordinates the use of available tools to protect marine biodiversity. Primary tools are the Fisheries Act 1996 regulations, and marine reserves. Other tools that may contribute are available under the Resource Management Act. This Act is administered by Regional Councils.

Figure 4. Proposed Framework for Aquatic Habitat Management



- 177 The Strategy provides a mechanism by which MFish biodiversity obligations in respect of marine habitat can be met. There is significant overlap between MFish habitat protection obligations in respect of biological diversity, Associated or Dependent Species, and habitat of particular significance for fisheries management. Therefore, the MPA Strategy will contribute to meeting all these obligations. MFish obligations in respect of freshwater habitat will be met in a similar manner. An outline of the proposed approach is shown in Figure 4.
- 178 This approach has a number of advantages when compared with the current, reactive approach to managing the effects of fishing on the aquatic environment.
- Ensures a planned, proactive approach to protection of aquatic habitat
 - Provides for integration of biodiversity-related habitat protection measures implemented by MFish and the Department of Conservation
 - Takes into account measures implemented by other agencies and fisheries stakeholders that may have the effect of protecting biodiversity e.g. mataitai, industry codes of practice, cable zones, restrictions imposed by regional councils
 - Provides for the use of a “best method” approach to achieve the necessary level of protection for aquatic habitat i.e. the method that achieves the required outcome at the least cost
- 179 This approach is also consistent with the overall framework set out in this Strategy. In respect of habitat protection, the Government’s standard setting role comprises the determination of how much of each type of habitat requires protection, and a regular assessment of how much is protected. The management role—which can be undertaken by stakeholders or the Government—will involve designing and implementing habitat protection measures to meet the protection requirement standards. Fishery stakeholders are well placed to use verifiable codes of practice and voluntary area closures to help meet these standards. Under the proposed MPA Strategy, these measures would be taken into account in the annual inventory of marine protected areas.
- 180 This approach does not address the need to align the processes of other agencies to ensure that marine protected areas are not undermined by other activities such as mining (administered by the Ministry for Economic Development), dumping outside 12 nautical miles (administered by the Maritime Safety Authority) and dumping and other activities inside 12 nautical miles (administered by regional councils). Neither does it provide for a ‘best value’ approach to the use of marine resources. The required alignment may be achieved through the Oceans Policy initiative. In the interim, protocols between agencies are required.

Research Priorities

- 181 In respect of habitat management, it is proposed that research should be focused on obtaining sufficient information to implement the draft Marine Protected Areas Strategy and address additional obligations. Key steps in the draft Marine Protected Areas Strategy requiring scientific support include:
- classifying aquatic habitat into habitat types
 - determining the amount of each habitat type that requires different levels of

protection

- prioritising habitat protection requirements
- regularly assessing the amount of each habitat type that is protected

182 Other obligations for which scientific support will be required include protection of habitat of particular significance to fisheries management, and freshwater habitat.

Proposed Actions: Habitat Management

Note: A number of the actions in this section are based on those contained in the preliminary draft Marine Protected Areas Strategy. Actions and completion dates will change as the preliminary draft Strategy is revised and consulted on.

MFish has a number of responsibilities related to the implementation of the Marine Protected Areas Strategy. Specifically, MFish will:

- Produce a report detailing inshore legislative and regulatory closures and their ability to contribute to the network of marine protected areas (2003)
- Develop guidelines for monitoring marine protected areas existing or established under the Fisheries Act for potential threats to their biodiversity values including seeking notification of possible threats arising from uses not related to fishing (2003)

In association with DoC, MFish will:

- Continue to contribute to the streams of work on marine classification leading into the first annual report on the marine protected areas network. Relevant projects include:
 - Marine Environment Classification (led by Ministry for the Environment)
 - Near shore classification (DoC)
 - Biodiversity of selected marine areas (MFish)
- Develop protocols to establish how the two agencies will work together when planning for and establishing representative marine protected areas
- Report annually to Biodiversity Ministers with details on:
 - Progress on the definition and classification of ecotypes
 - Progress on achieving the network of representative areas
 - Priorities for future protected areas

Cont.

Proposed Actions: Habitat Management—Continued

In addition to actions related to the MPA Strategy, MFish will also undertake specific actions in respect of other habitat management related responsibilities. These are:

- In relation to the protection of habitat of particular significance to fisheries management:
 - Review the policy definition of *habitat of particular significance to fisheries management* (2003, 2004)
 - Undertake research required to identify such habitat (ongoing)
 - Evaluate whether any additional protection is required and implement appropriate protection where required (ongoing)
 - Develop an MFish policy covering the creation of artificial habitats for fisheries (2004, 2005)
- Assess freshwater habitat protection requirements (2005)
- Continue to work within the Oceans Policy process to help ensure frameworks are developed to provide appropriate coordination of processes between agencies (ongoing)

MANAGING INDIRECT EFFECTS OF FISHING ON THE AQUATIC ENVIRONMENT

Proposed Approach

183 The current situation in which there is little quantitative information on the indirect effects of fishing will likely continue for some time. It is important that overseas developments in ecosystem modeling and management are followed closely and followed where appropriate. Research in this area should be undertaken, as appropriate, in New Zealand. Where species affected by fishing are identified as a major food source (or is otherwise important) for another species, consideration should be given to modifying relevant sustainability measures, if this is necessary to mitigate the indirect effects. Examples include reducing the TAC for a fish stock or establishing a fishing exclusion zone around areas where the predator species occurs.

Research Priorities

184 Compared with our understanding of the effects of fishing on target fish stocks, our understanding of the indirect effects of fishing is poor. Research is being undertaken on at least two levels—modelling of whole ecosystems and modelling of the relationship between individual species and their major prey.

185 Attempts to model the interactions between all major species in an ecosystem have, for the most part, highlighted the complexity of marine ecosystems but have not provided viable tools by which management of target stocks can be modified to take into account indirect effects of fishing. In New Zealand, the Ecopath modelling tool has been used to model interactions in the Southern Plateau Ecosystem. The exercise was useful in identifying the type of information required to build such a model, the gaps in our information, and possible directions for ecosystem modelling, but it does not provide quantitative information with which to modify management of fisheries. However, the model does point to the possible importance of squid in the ecosystem, which might be an indicator of the need for further study on the interactions between squid and other species in the ecosystem.

186 Work has been undertaken on specific predator-prey interactions and how they are affected by fishing. For example, extensive work has been undertaken on the diet of the Stellar Sea lion in Alaska to determine whether the decline in the Stellar Sea lion population is caused by a reduction in the availability of Pollock as a result of the Pollock fishery.

187 The limited research budgets in this country and the high cost of developing ecosystem models to the point of being able to provide quantitative information for fisheries management suggests that this research should not be accorded a high priority. However, some research in this area should be undertaken on an ongoing basis. Even if research in this area is restricted to modeling one ecosystem each year or two, the development of these models, will, over time contribute to our understanding and ability to manage indirect effects of fishing.

Proposed Actions: Indirect Effects

In respect of research on the indirect effects of fishing, MFish will:

- Monitor overseas research on aquatic ecosystem modelling and utilise the results of this research, as appropriate (ongoing)
- Undertake research on specific interactions between species affected by fishing and other species to determine the indirect effects of fishing; monitor relevant overseas research (2003; ongoing)

In respect of setting standards for managing the indirect effects of fishing, MFish will:

- Ensure standards used for the assessment of the effects of a fishery account for the indirect the effects of fishing (2004)
- Develop standards for modifying sustainability measures, as appropriate, where strong interactions between species indicate the likelihood of the indirect effects of fishing (2004, 2005)

Part 5: Additional Information

GLOSSARY

Adaptive Management Programme (AMP)

A mechanism for varying the TAC and TACC of fish stocks for which MFish has limited information. May be implemented where the available information suggests that:

- there is reasonable probability that current biomass is greater than the size that will support the MSY; and
- on balance the new TACC and TAC level is likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five-year period of the programme.

More generally, adaptive management involves incorporation of monitoring and review mechanisms to account for additional information that becomes available.

Aquatic ecosystem

The complex of a community of organisms and its environment functioning as an ecological unit

Aquatic environment

The conditions under which an organism lives, thus including all living or non-living factors and the activities of humans.

Aquatic habitat

The environment in which a species lives, including everything that surrounds and affects its life: e.g., water quality; bottom; vegetation; associated species (including food supplies).

Associated or Dependent Species

Defined in the Fisheries Act 1996 as any non-harvested species taken or otherwise affected by the taking of any harvested species. They are specifically prohibited from being targeted commercially.

Benthic

Associated with the seabed e.g. benthic animals and plants or benthic habitat

Biological diversity (biodiversity)

The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.

Commercial fishing

Fishing undertaken for a profit. A commercial fisher must hold a permit issued under the Fisheries Act 1996.

Customary fishing

Fishing undertaken by tangata whenua under the Customary Fishing Regulations for traditional, customary, and marae functions.

Ecosystem Approach to Fisheries

The management of ecosystems and natural habitats to meet human requirements to use natural resources, while maintaining the biological richness and ecological processes necessary to sustain the composition, structure and function of the habitats or ecosystems concerned.

Endemism

Species only found in a particular (often isolated) area.

Fishing related mortality

Mortality of species attributable to fishing activities. Includes mortality of fish species, both targeted and non-targeted, and of non-fish by-catch e.g. seabirds and marine mammals.

Harvested Species

Any fish, aquatic life, or seaweed that may for the time being be taken with lawful authority.

Marine reserve

Specified areas of aquatic habitat managed for the purpose of preserving them in their natural state and for scientific study. The purpose of marine reserves is expected to change as a result of the Marine Reserve Bill currently before Parliament.

Population Management Plan (PMP)

A plan of management established under the Wildlife Act 1953 or the Marine Mammal Protection Act 1978. Section 15 of the Fisheries Act 1996 requires MFish to take steps to adhere to a PMP.

Protected Species

Any marine wildlife as defined s 2 of the Wildlife Act 1953 that is absolutely protected under s 3 of that Act or any marine mammal as defined in s 2(1) of the Marine Mammals Protection Act 1978.

Recreational fishing

Takes place under the Amateur Fishing Regulations. Recreational fishing is primarily for pleasure or/and food; the catch is usually kept for personal consumption and may not be sold or traded.

Sustainability Measures Round

The bi-annual process by which MFish provides the Minister of Fisheries with advice on sustainability measures and other management controls. Measures include total allowable catches, apportioning that catch among customary, recreational and commercial fishers, and regulations to manage the effects of fishing on the environment. The process involves extensive consultation.

Threatened Species

A term used to mean *vulnerable* or more loosely used to include rare, vulnerable and endangered species.

IMPLEMENTATION PLAN

Introduction

188 This implementation plan lists all the specific actions identified in the Strategy for Managing the Adverse Effects of Fishing. Some actions are already being implemented; others will be proposed in relevant MFish business planning documents, and in research proposals. Final decisions on the proposed actions will depend on priorities and the availability of funding.

Proposed Actions: Standard Setting

189 MFish will:

- (a) Appoint staff to new positions in the MFish Fisheries Management Group with a focus on setting environmental standards and evaluating fishery management initiatives against those standards (2002, 2003; under way)
- (b) Appoint staff to new positions in the MFish Science Team, including a Science Manager—Aquatic Environment, to support the development of environmental standards and provide scientific advice on the management of the effects of fishing on the aquatic environment (2002, 2003; under way)
- (c) Develop standards for assessing the environmental risks posed by a fishery (2003, 2004).
- (d) Develop generic performance standards for managing the effects of fishing on the aquatic environment (2002–2004; under way)
- (e) Develop process standards for major processes associated with management of the effects of fishing on the aquatic environment (2003, 2004)
- (f) Require an assessment of the environmental risks posed by a fishery to be completed for new or developing fisheries prior to development of the fishery (2004) and for existing fisheries (2007).
- (g) Develop standards for reporting fisheries management performance against environmental standards (2003–2005)
- (h) Develop and implement sanctions for non-performance against environmental standards (2003–2005)

Actions: Factors in Setting Environmental Standards

190 MFish will:

- (a) review international fisheries-related environmental obligations and domestic instruments to ensure New Zealand is meeting relevant obligations (2004 and thereafter on a 5-yearly basis)
- (b) review proposed domestic legislation to ensure it is consistent with international fisheries-related environmental obligations (ongoing)

- (c) MFish will commission research to better understand tangata whenua values and other societal values relating to management of the effects of fishing on the aquatic environment (2004; ongoing)

Actions: Partnership

191 MFish will:

- (a) Establish an Aquatic Environment Management Advisory Group as a forum for stakeholder input to setting environmental standards (2003, 2004)

Actions: Monitoring and Review

192 MFish will:

- (a) Review the implementation of actions contained in this Strategy (3-yearly)
- (b) Utilise existing programmes to monitor the state of the aquatic environment and management of the effects of fishing (ongoing)
- (c) Determine whether additional monitoring mechanisms are required (2005)

Actions: Non-target Species

193 In respect of the species threat classification system, MFish will:

- (a) Extend the species threat classification system to cover additional Associated or Dependent Species (2003–2008; research proposal submitted)
- (b) Re-assess Associated or Dependent Species within the threat classification system on a 5-yearly basis; re-assess individual species sooner where significant new information becomes available (ongoing)

194 In respect of research priorities, MFish will treat as a high priority:

- (a) Obtaining sufficient information on Associated or Dependent Species affected by fishing and Protected Species affected by fishing to allow a species threat classification to be undertaken (2003; ongoing)
- (b) Obtaining sufficient information on species with a high threat status to enable specific standards to be set (2003; ongoing)
- (c) Assess the part habitat protection will play in maintaining Associated or Dependent Species at or above viable levels (2003–2005)

195 In respect of environmental standards, MFish will develop:

- (a) Standards for the processes by which the effects of fishing on Associated or Dependent Species and Protected Species, should be managed (2003–2005)
- (b) Performance standards determining acceptable effects of fishing on specific Associated or Dependent Species and Protected Species (2003; ongoing)

Actions: Habitat Management

Note: A number of the actions in this section are based on those contained in the preliminary draft Marine Protected Areas Strategy. Actions and completion dates will change as the Strategy is revised and consulted on.

- 196 MFish has a number of responsibilities related to the implementation of the Marine Protected Areas Strategy. Specifically, MFish will:
- (a) Produce a report detailing inshore legislative and regulatory closures and their ability to contribute to the network of marine protected areas (2003)
 - (b) Develop guidelines for monitoring marine protected areas existing or established under the Fisheries Act for potential threats to their biodiversity values including seeking notification of possible threats arising from uses not related to fishing (2003)
- 197 In association with DoC, MFish will:
- (a) Continue to contribute to the streams of work on marine classification leading into the first annual report on the marine protected areas network. Relevant projects include:
 - i. Marine Environment Classification (led by Ministry for the Environment)
 - ii. Near shore classification (DoC)
 - iii. Biodiversity of selected marine areas (MFish)
 - (b) Develop protocols to establish how the two agencies will work together when planning for and establishing representative marine protected areas
 - (c) Report annually to Biodiversity Ministers with details on:
 - i. Progress on the definition and classification of ecotypes
 - ii. Progress on achieving the network of representative areas
 - iii. Priorities for future protected areas
- 198 In addition to actions related to the MPA Strategy, MFish will also undertake specific actions in respect of other habitat management related responsibilities. These are:
- (a) In relation to the protection of habitat of particular significance to fisheries management:
 - i. Review the policy definition of *habitat of particular significance to fisheries management* (2003, 2004)
 - ii. Undertake research required to identify such habitat (ongoing)
 - iii. Evaluate whether any additional protection is required and implement appropriate protection where required (ongoing)
 - iv. Develop an MFish policy covering the creation of artificial habitats for fisheries (2004, 2005)

- v. Assess freshwater habitat protection requirements (2005)
- vi. Continue to work within the Oceans Policy Process to help ensure that frameworks are developed to provide appropriate coordination of processes between agencies (ongoing)

Actions: Indirect Effects of Fishing

199 In respect of research on the indirect effects of fishing, MFish will:

- (a) Monitor overseas research on aquatic ecosystem modelling and utilise the results of this research, as appropriate (ongoing)
- (b) Undertake research on specific interactions between species affected by fishing and other species to determine the indirect effects of fishing; monitor relevant overseas research (2003; ongoing)

200 In respect of setting standards for managing the indirect effects of fishing, MFish will:

- (a) Ensure standards used for the assessment of the effects of a fishery account for the indirect the effects of fishing (2004)
- (b) Develop standards for modifying sustainability measures, as appropriate, where strong interactions between species indicate the likelihood of the indirect effects of fishing (2004, 2005)