

Developing a Strategy for Managing the Environmental Effects of Fishing

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Abstract. There is increasing awareness of and concern about the actual and potential adverse effects of fishing on the aquatic environment. New Zealand, like many other countries, has developed a range of initiatives to address specific issues related to the effects of fishing, including establishing marine reserves, fishing method restrictions, observer programmes, imposition of marine mammal bycatch limits and the requirement for fishers to use bycatch mitigation devices. However, to date, these initiatives have been largely reactive and somewhat *ad hoc*. The Fisheries Act 1996 establishes a set of strong environmental and information obligations, including requirements to avoid, remedy and mitigate any adverse effects of fishing on the aquatic environment, meet the foreseeable needs of future generations, and be cautious when information is uncertain, unreliable or inadequate. The principles in the Act form the basis for developing a strategy for managing the effects of fishing on the aquatic environment. In this paper we describe the process being used to develop the Strategy, key components of the Strategy, and associated policy challenges.

Key words: fisheries, environmental strategy, aquatic environment, ecosystem

1. INTRODUCTION

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.

New Zealand, like many other countries, has developed a range of initiatives to address specific issues related to the effects of fishing, including establishment of marine reserves, fishing method restrictions, observer programmes to monitor commercial catches, marine mammal bycatch limits, and the requirement for fishers to use bycatch mitigation devices. However, to date, these initiatives have been largely reactive and somewhat *ad hoc*. The Fisheries Act 1996 establishes a set of strong environmental and information obligations including:

- Avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment.
- Meet the reasonably foreseeable needs of future generations.
- Maintain associated or dependent species above a level that ensures their long-term viability.
- Maintain biological diversity of the aquatic environment.
- Protect habitat of particular significance for fisheries management.
- Use the best available information when making decisions.
- Consider uncertainty when making decisions.
- Exercise caution when information is uncertain, unreliable, or inadequate.
- Not use the absence of, or any uncertainty in, any information as a justification for postponing or failing to take a measure designed to achieve the purpose of the Act.

Currently, there is explicit recognition of environmental obligations in a number of Ministry of Fisheries (MFish) processes and a number of the key processes operated by MFish require that effects on the aquatic ecosystem be specifically addressed. However, there is no co-ordinated approach to implementing environmental obligations.

In an international context, New Zealand's fisheries management regime is held in high regard. However, there is a widely held view, both within MFish and by some fisheries stakeholders, that MFish should do more to ensure that environmental obligations are met. To address the environmental obligations in a comprehensive way, MFish is developing the *Strategy for Managing the Environmental Effects of Fishing* (the Strategy). The Strategy is designed to implement an ecosystem approach to fisheries, make significant improvements in managing the environmental effects of fishing and ensure MFish meets its environmental obligations in an efficient and consistent way.

In this paper we first discuss the distinctive features of the process used to develop the Strategy. We then describe key elements of the draft Strategy before discussing environmental standards and factors that will be taken into account when setting standards. We then discuss key challenges expected in the implementation of the Strategy. This paper is based on a preliminary draft of the Strategy and changes are expected prior to the Strategy being finalised. Future drafts of the Strategy will be available on the MFish website (www.fish.govt.nz).

2. INNOVATIVE PROCESS

Development of the Strategy has differed from MFish's traditional approach to policy development. MFish commissioned a report to inform officials and stakeholders about key issues and possible approaches to managing the environmental effects of fishing, consulted with stakeholders at a number of stages and in different formats, and provided funding to key stakeholders to enhance their input to the project. Environmental stakeholder groups have frequently highlighted lack of funding as an obstacle to their involvement in annual and one-off fishery management consultation processes. Noting the importance of this project to environmental stakeholder groups, the Minister of Fisheries decided that the Government would provide a total of \$50,000 to help environmental stakeholder organisations provide input to the preparation of the Strategy. Four environmental stakeholder organisations (two working together) sought and received funding to:

- Identify and rank environmental stakeholder concerns about fisheries impacts on the aquatic environment.
- Identify the appropriate balance between protection and use of fishery resources required to address these concerns, along with the rationale for and implications of this balance.

The groups chose different approaches. One used a structured telephone survey to identify members' views, the two groups working together prepared a discussion paper and held a series of meetings to determine stakeholder views, and the other group based its work on a series of in-depth interviews with a range of key stakeholders. The reports prepared by the environmental stakeholder groups revealed a high level of concern about a range of environmental issues—effectively ranking a number of issues as highest priority. None of the reports provided an explicit recommendation of the appropriate balance between protection and use of fishery resources, however, two implicitly recommend reduced use and greater protection than currently exists.

Following preparation of the reports by environmental stakeholder groups, MFish consulted with all stakeholders concerning the preferred approach for addressing the management of the effects of fishing on the aquatic environment. MFish provided all stakeholder groups with copies of the three reports by environmental stakeholder groups, and the report commissioned by MFish. They were asked to provide feedback on a series of issues including:

- Objectives for the management of fishing impacts on the aquatic ecosystem.
- Approaches to determining research and management priorities in the area of fishing impacts.
- How to ensure that the approach taken to managing fishing impacts is consistent with Maori¹ values.
- Incentives to influence behaviours to improve management of the environmental effects of fishing.
- Methods for determining the appropriate balance between protection and use of fisheries resources in order to manage fishing impacts.

Based on feedback from stakeholders and the reports by environmental stakeholder groups and experts, MFish is currently completing writing a draft Strategy. This will be released for another round of consultation before being reviewed and finalised. The "final" Strategy is expected to be ready for implementation in the latter part of 2003 and will be reviewed on a regular basis. An implementation plan sets out a timetable for the completion of key tasks identified in the Strategy.

3. KEY ELEMENTS OF THE STRATEGY

Defining the scope of the Strategy is important both to manage expectations and keep the Strategy focussed and manageable. The Strategy focuses on the management of the adverse effects of fishing on the aquatic ecosystem. It does not address management of target fishstocks, biosecurity, or non-fisheries effects (e.g. land-generated pollution and sedimentation) on the aquatic environment. Neither does it address adverse effects of

¹ Maori are the indigenous people of New Zealand.

fishery that are common across maritime industries such as the effects of fuel spills and the effects of carbon emissions from vessel engines. These are addressed in other strategies and initiatives developed by MFish and other government agencies. Developing effective linkages between the Strategy and these other strategies and initiatives is important in light of the integrated nature of the aquatic environment. The key elements of the Strategy are shown in Figure 1.

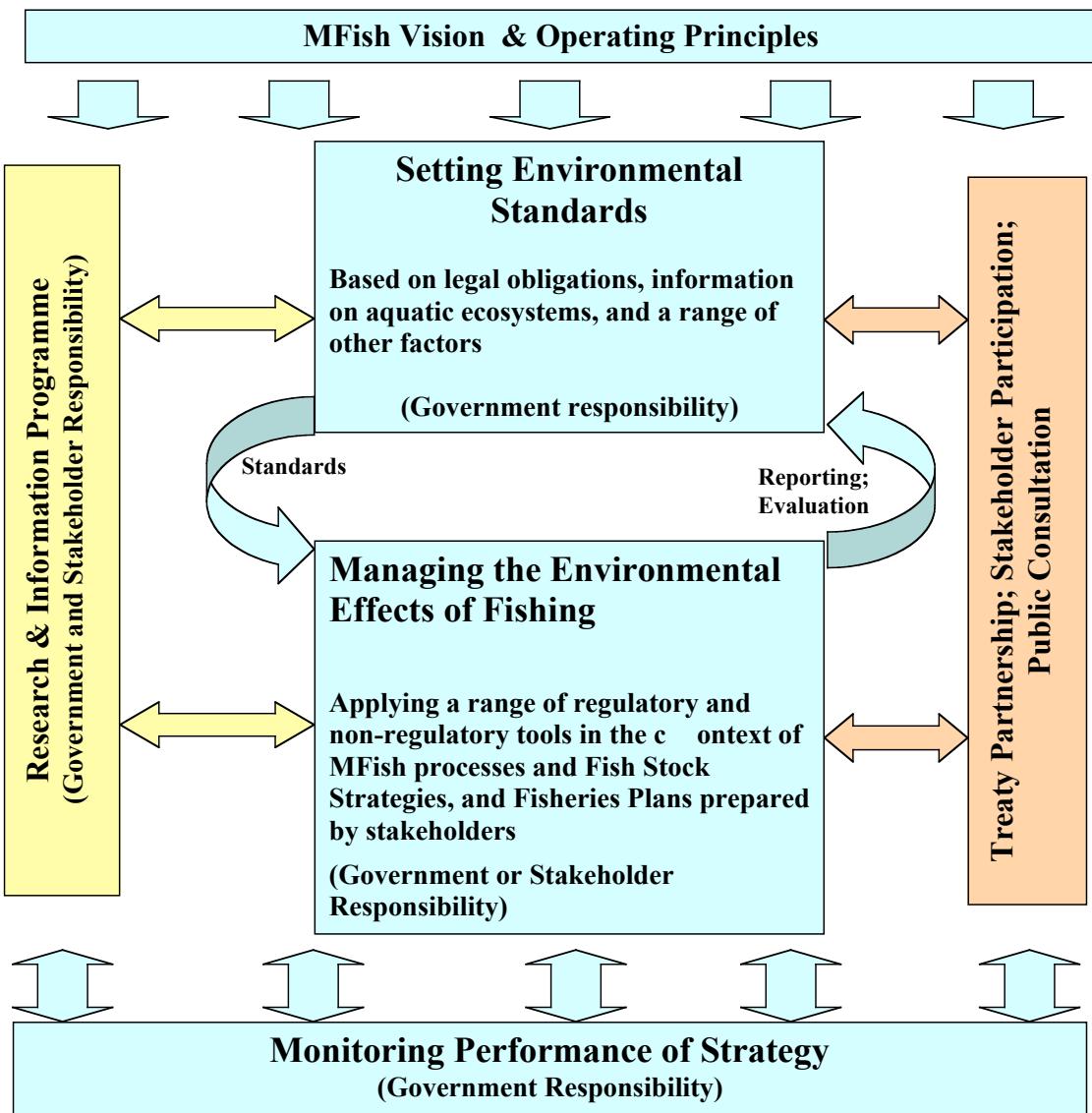


Figure 1. Key Elements of the Draft Strategy for Managing the Environmental Effects of Fishing

Central to the Strategy is a requirement for the Government to set clear standards to manage the adverse effects of fishing. Three management categories are identified covering non-target-catch, aquatic habitat, and the indirect ecosystem effects of fishing such as food chain effects. The categories overlap to some degree but are useful for planning purposes. The habitat and non-target species (bycatch) categories are expected to be the biggest work areas in the short to medium term. There is relatively little quantitative information about the indirect effects of fishing on the aquatic environment. Overseas developments in ecosystem modelling and management will be followed closely and research will be undertaken, as appropriate, in New Zealand. Where a species affected by fishing is identified as a major food source (or is otherwise important) for another species, consideration will be given to modifying relevant sustainability measures such as the total allowable catch or the requirement for fishing exclusion zones.

Managing the adverse effects of fishing—to Government-set standards—will be undertaken either by MFish through fish stock strategies, or by fishers through fisheries plans approved by the Minister of Fisheries. A 1999 amendment to the Fisheries Act 1996 allows stakeholders to develop a fisheries plan (at this stage most likely to be commercial and customary Maori fishing interests given the level of organisational capacity required). These plans have to comply with the overarching obligations in the Fisheries Act, but enable fishers to develop more innovative approaches to fisheries management including integrating management with market requirements.

Research and information will inform both standard setting and implementation at the fishery level. On-going monitoring and evaluation will be required. In particular, MFish envisages regular reporting on the threat status of protected species, along with reporting on the amount of different habitat types that are protected.

Effective participation by customary Maori, recreational and commercial fishers, environmental organisations, and others with an interest in managing the environmental effects of fishing is important for the development and on-going implementation of the Strategy. Standard setting is a particularly important area for participation. If stakeholders are involved in standard setting and have confidence in the standards, they are more likely to abide by the standards and support future operation of fisheries provided they meet the standards.

4. ENVIRONMENTAL STANDARDS

The 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. To encourage innovation and efficiency, standards will be designed to provide for maximum flexibility in how they can be achieved.

MFish proposes, in the first instance, establishing environmental standards relating to the species and habitats requiring protection rather than standards relating to types of fisheries. 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 standards only for different types of fisheries could result in unacceptable effects on a particular non-target species as a result of the cumulative effects of a number of fisheries or the cumulative effects of fishing and non-fishing activities.

Two types of standards are envisaged – process standards and performance standards. Process standards will set out requirements for the processes by which the effects of fishing on the aquatic environment are managed. Examples of process standards include those relating to consultation, data quality, monitoring, performance reporting, and protocols for modifying performance standards.

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 habitats, populations, catch limits etc. They may be expressed in terms of specific numbers 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 or multi-year basis.

5. STANDARD SETTING PROCESS

Development of environmental standards requires careful consideration of a number of factors. Some of these factors cannot be maximised simultaneously and, therefore, trade-offs must be made. Ultimately, responsibility for making those trade-offs and determining environmental standards lies with the Minister of Fisheries. However, effective stakeholder input to the decision-making process is important for ensuring that a broad range of possible options for standards is considered, that the best available information is used, and to help ensure stakeholder support for the standards.

Standard setting will be guided by the MFish Vision (set out in the *MFish Strategic Plan; 2003–2008*) and by the Operating Principles developed in the Strategy. The Vision 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 each other. A vision can be achieved in different ways. The Operating Principles in the Strategy set out how MFish intends to achieve the Vision. They are intended to guide the actions of MFish and stakeholders and provide greater certainty about the way MFish will approach management of the effects of fishing on the environment.

The Operating Principles include:

- Requiring management actions to provide for utilisation of fisheries resources within constraints—including ensuring sustainability (the purpose of the Fisheries Act 1996).
- Working closely with Maori and other stakeholders.
- The importance of a learning culture.
- Being proactive.
- Encouraging innovation.
- Ensuring roles and accountabilities are clear.
- Consideration of compliance and enforcement costs in standard setting.

An important new principle is that the onus to demonstrate that the effects of fishing are acceptable will be on those responsible for managing the fishing activity—whether MFish through a fish stock strategy or fishery stakeholders through a fisheries plan.

The Strategy proposes 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. The amount and quality of information concerning both the likelihood and consequence of the effects is an important factor in risk management, especially since there is an obligation for decision makers to be cautious where information is uncertain, unreliable or inadequate. Initially, assessment of likelihood and consequence of effects may be largely qualitative, but, over time, increased information should allow a move toward a more quantitative assessment. The Strategy suggests that environmental standards should require management actions and reporting appropriate to the level of risk. 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.

6. FACTORS IN STANDARD SETTING

The Strategy identifies a number of key factors that should be taken into account when setting environmental standards. These are described briefly.

6.1 Environmental Obligations

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 the Fisheries Act 1996 and other 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.

6.2 Treaty Obligations

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 Maori on management of the effects of fishing will be taken into account when determining environmental standards. The MFish Treaty Strategy, currently under development, will establish a number of Regional Maori Forums and regionally based Treaty Coordinator positions. These are designed to build effective relationships between MFish and Maori 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.

6.3 Societal Values

Where appropriate, government-set standards for management of the effects of fishing on the aquatic environment will incorporate Maori values and other societal values—in addition to scientific information on minimum levels to ensure viability. 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 minima. For example, the Act provides that 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.

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. We observe that consumers of New Zealand seafood in some key markets appear to have higher expectations concerning the management of the environmental effects of fishing than those held by many New Zealanders. This adds a commercial incentive for higher environmental standards.

6.4 Utilisation Considerations

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.

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 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 standard 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.

6.5 Compliance and Incentives

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.

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 measure 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 levels of services cost-recovered from the industry and improved prices for products (through certification programmes).

6.6 Learning from Experience

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 New Zealand fisheries management and, consequently, there is little experience on which to base new environmental standards. It is expected that environmental standards, fish stock strategies and fisheries plans will be developed and implemented 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.

7. KEY CHALLENGES

Although building on existing processes, this Strategy signals important changes in the way MFish approaches management of the environmental effects of fishing. Change is difficult and implementation of the Strategy will need to be managed carefully. Key challenges are discussed briefly.

Adopting an ecosystem approach to fisheries, as proposed in the Strategy, 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.

Some methods proposed for implementing an ecosystem approach to fisheries require large amounts of information, are costly, and require an understanding of aquatic ecosystems that is currently beyond the ability of science to deliver. This has a number of implications for fisheries management including:

- An ecosystem approach to fisheries can only be adopted in a staged manner with developments in management keeping pace with increased information availability.
- Innovative, cost-effective methods for implementing an ecosystem approach to fisheries should be sought.
- Where there is insufficient information with which to address a particular effect of fishing on aquatic ecosystems, a cautious approach to management should be adopted.

The New Zealand fishing industry has coped with very significant changes over the last three decades, including the imposition of increasingly stringent environmental standards. Undoubtedly, the industry can cope with even higher environmental standards. However, the pace of change should allow the industry time to adjust to the changes and the opportunity to develop innovations to minimise the impacts on their industry of the higher standards.

Another key challenge is to integrate the various management initiatives relating to the management of the aquatic environment. This Strategy is focused on the effects of fishing on the aquatic environment. There are many other uses of the aquatic environment and many of these activities have adverse effects. Major examples include seabed mining, marine farming, reclamation, and land-based pollution of various types. Different legislative frameworks control these activities and integration of these frameworks is incomplete. Fishery stakeholders are concerned that their activities may be restricted to protect some aspect of the aquatic environment while a non-fishing activity that also affects the same aspect of the aquatic environment may be allowed to continue unchecked. An Oceans Policy is currently under development in New Zealand and is intended to provide an overall vision for New Zealanders' interaction with the aquatic environment. It should go some way to providing the necessary integration.

Managing the adverse effects of fishing on the aquatic environment is difficult and there are no simple solutions. However, it is clear that the status quo is no longer acceptable. The *Strategy for Managing the Environmental Effects of Fishing* signals an intent to make significant improvements in managing the effects of fishing. The proposed changes have the potential to be costly and must be implemented at a pace that allows stakeholders to adjust. Success will require strong leadership from the government and the continued input and participation of all those who have a stake in management the aquatic environment.