

Strategy for Managing the Environmental Effects of Fishing



MINISTRY OF FISHERIES
Te Tautiaki i nga tini a Tangaroa

New Zealand Ministry of Fisheries

Te Tautiaki i nga tini a Tangaroa
(Guardians of the multitudes of Tangaroa)

2005

Overall Fisheries Outcome:

The value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment is maximised.

Value to all New Zealanders is described as:

- **The value** to present and future generations of preserving the structure, function, and biodiversity of our aquatic environment
- **The value** to Māori of sustainable aquatic resources and a healthy aquatic environment
- **The value** gained from the pleasure of fishing for recreation
- **The value** of a thriving seafood industry
- **The value** of flourishing communities with a strong fisheries sector at their heart

The Ministry of Fisheries has identified four outcomes that contribute to achieving this overall fisheries outcome:

- The health of the aquatic environment is protected
- People are able to realise the best value from the sustainable and efficient use of fisheries
- Crown obligations to Māori with respect to fisheries are delivered
- Credible fisheries management

Source: Ministry of Fisheries Statement of Intent 2005/2008

Message from the Minister of Fisheries



Our oceans and fisheries provide a valuable resource for all New Zealanders.

We have world-class management systems, and most of our major fisheries are currently at or above sustainable levels. But fish exist in a complex aquatic environment and fishing can significantly affect parts of this.

We have already taken important steps to minimise fishing's footprint on marine ecosystems. These include managing target fish stocks sustainably, closing areas to protect seabed communities, requiring seabird mitigation devices and techniques to be used in some fisheries, and imposing bycatch limits in others.

But we need to do more. In fact, we want to take our environmental performance to the same world-leading standards as our fisheries management has reached.

The *Strategy for Managing the Environmental Effects of Fishing* is a new milestone in improving the environmental performance of our fisheries. It describes how we will set limits around the effects of fishing, including the key factors we will consider when doing so.

The Government will work with all stakeholders to set these limits. This will involve weighing up matters like biological limits around sustainability, society's views on the appropriate balance between use and protection, and the needs of future generations. The Government will also work with all stakeholders to ensure fishing activities meet these standards.

I encourage all stakeholders to become involved in this process.

A handwritten signature in black ink, appearing to read 'David Benson-Pope', followed by a long horizontal line extending to the right.

Hon. David Benson-Pope
MINISTER OF FISHERIES

Commonly Used Terms

Aquatic Environment: As defined in section 2 of the Fisheries Act 1996 the term Aquatic Environment means

- a) the natural and biological resources comprising any aquatic ecosystem:
- b) includes all aquatic life and the oceans, seas, coastal areas, intertidal areas, estuaries, rivers, lakes and other places where aquatic life exists.

Ecosystem: An organisational unit consisting of an aggregation of plants, animals (including humans) and micro-organisms, along with the non-living components of the environment. (FAO 2003: Fisheries Management – The Ecosystem Approach To Fisheries, FAO Technical Guidelines for Responsible Fisheries 4 (2))

Fisheries plans: Specify what the government, tangata whenua, and stakeholders want to achieve for specific fisheries (the objectives), and associated implementation strategies and services (including research, regulations, and compliance) to achieve the objectives. Fisheries plans are approved by the Minister of Fisheries under s.11A of the Fisheries Act 1996. A plan may deal with one or more stocks, it may focus on particular areas, and it may cover a number of years.

Habitat: The place or type of site where species and communities normally live or grow, usually characterised by relatively uniform physical features or by consistent plant forms. (FAO 2003: The Ecosystem Approach To Fisheries – Issues, terminology, principles, institutional foundations, implementation and outlook, FAO Fisheries Technical Paper 443)

Indirect Effects of Fishing: Where an effect of fishing on one species also affects other species as a result of food chain (or other) relationships.

Non-Target Catch (Bycatch): Any living material taken in fishing operations that is not wanted by the fisher. This includes:

- Damaged and undersize fish of the target species
- Fish species for which there is no current commercial market
- Fish species for which the harvester does not hold catching rights
- Protected Species: Species that are specifically protected under the Wildlife Act 1953 or the Marine Mammal Protection Act 1978; includes seabirds, marine mammals, and corals.

Stakeholders: 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.

Tangata whenua: In relation to a particular area, means the hapū, or iwi, that is Māori and holds mana whenua (customary authority) over that area.

Table of Contents

Message from the Minister of Fisheries	
Commonly Used Terms	iv
Table of Contents	v
1.0 Introduction	1
1.1 Background	1
1.2 Context	2
1.3 Scope	3
1.4 Terminology	3
1.5 Key Changes	4
1.6 Principles	4
2.0 Framework to Manage the Environmental Effects of Fishing	5
2.1 Introduction	5
2.2 Setting Environmental Standards	6
2.2.1 Principles	6
2.2.2 Overview	6
2.2.3 Setting Standards	7
2.3 Managing Fisheries to Achieve Environmental Standards	8
2.3.1 Principles	8
2.3.2 Overview	8
2.3.3 Identifying Relevant Standards and Appropriate Response	8
2.3.4 Managing Fisheries to Meet Environmental Standards	9
2.4 Information, Inputs, and Linkages	10
2.4.1 Overview	10
2.4.2 Information	10
2.4.3 Partnership, Participation and Consultation	10
2.4.4 Links with Related Initiatives	11
2.5 Monitoring and Reporting	12
2.5.1 Principles	12
2.5.2 Monitoring	12
2.5.3 Reporting	12
3.0 Environmental Standards	13
3.1 Overview	13
3.2 Factors Contributing to Environmental Standards	13
3.3 Biological Factors	15
3.4 Current Use	16
3.5 Future Use	17
3.6 Nature of Environmental Standards	17
4.0 Strategy Implementation Plan	20
4.1 Standard Setting	20
4.2 Management to Achieve Standards	20
4.3 Information Input and Consultation & Coordination of Linkages.	20
4.4 Monitoring & Reporting	20

1.0 Introduction

1.1 Background

New Zealand's aquatic environment is valuable for many reasons—not least for its role in the production of fisheries resources—and its long-term health is an important part of the Government's sustainable development goals. Fishing is one of a number of human activities that have the potential to affect parts of the aquatic environment significantly.

Historically, most fisheries management systems have started with a focus on individual target stocks. Good management of target fish stocks is fundamental to managing the broader environmental effects of fishing—but is not enough. Worldwide, there is increasing recognition of the need to manage the effects of fishing on aquatic ecosystems. Recent publications and conferences have highlighted the potential effects of fishing practices and extensive work is being undertaken on methods to manage these effects.

Management of environmental effects typically address the effects of fishing on icon non-target species such as marine mammals and birds, and major fish by-catch species. Some have developed 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 those occurring through the food chain.

New Zealand, like many other countries, has put in place legislation intended to ensure that fishing does not unreasonably affect the aquatic environment. The purpose of the Fisheries Act 1996 is to provide for utilisation of fisheries resources while ensuring sustainability. The Act establishes 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, and be cautious when information is uncertain, unreliable or inadequate.

The New Zealand Government has developed a range of initiatives to address specific issues related to the effects of fishing, including establishment of marine protected areas, fishing method restrictions, observer programmes, imposition of marine mammal by-catch limits, and the requirement for fishers to use by-catch mitigation devices. However, to date, these initiatives have been largely reactive and lack overall coordination. A number of the Ministry of Fisheries' key processes require that effects on the aquatic ecosystem be addressed, but there is no strategy describing how the Ministry will meet environmental obligations across all its processes and activities.

This has led to concern, both within the Ministry of Fisheries and by fishery stakeholders, that the Ministry should do more to meet its environmental obligations. 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 the area of managing environmental effects was signalled in the Ministry of Fisheries 1998–2003 Strategic Plan, and confirmed in the Ministry's 2005–2008 Statement of Intent. The *Strategy for Managing the Environmental Effects of Fishing* (The Strategy) sets out the approach by which the Ministry will manage environmental effects.

The primary purpose of The Strategy is to provide policies through which the Ministry of Fisheries can meet its environmental obligations in the Fisheries Act 1996 in an efficient and consistent manner. The Strategy is also designed to provide for coordination of Fisheries Act environmental obligations with environmental obligations under other relevant legislation. Effective implementation of Fisheries Act 1996 environmental obligations will enable New Zealand to meet its international obligations to implement an ecosystem approach to fisheries.

1.2 Context

Consistent with the purpose of the Fisheries Act 1996, The Ministry of Fisheries has set an overall fisheries outcome:

The value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment is maximised.

The approach adopted by the Ministry of Fisheries to achieve this overall outcome is to establish management frameworks—including the Quota Management System (QMS) and fisheries plans—through which the Government and stakeholders can maximise the value obtained from the sustainable use of fisheries resources. Within these frameworks, standards set out the limits of the acceptable effects of fishing on both fish stocks and the aquatic environment. The place of standards in fisheries management frameworks is shown in Figure 1.

This Strategy is an important element of the approach to fisheries management signalled in the *Ministry of Fisheries Strategic Plan 2003–2008* and the *Ministry of Fisheries Statement of Intent 2005–2008*.

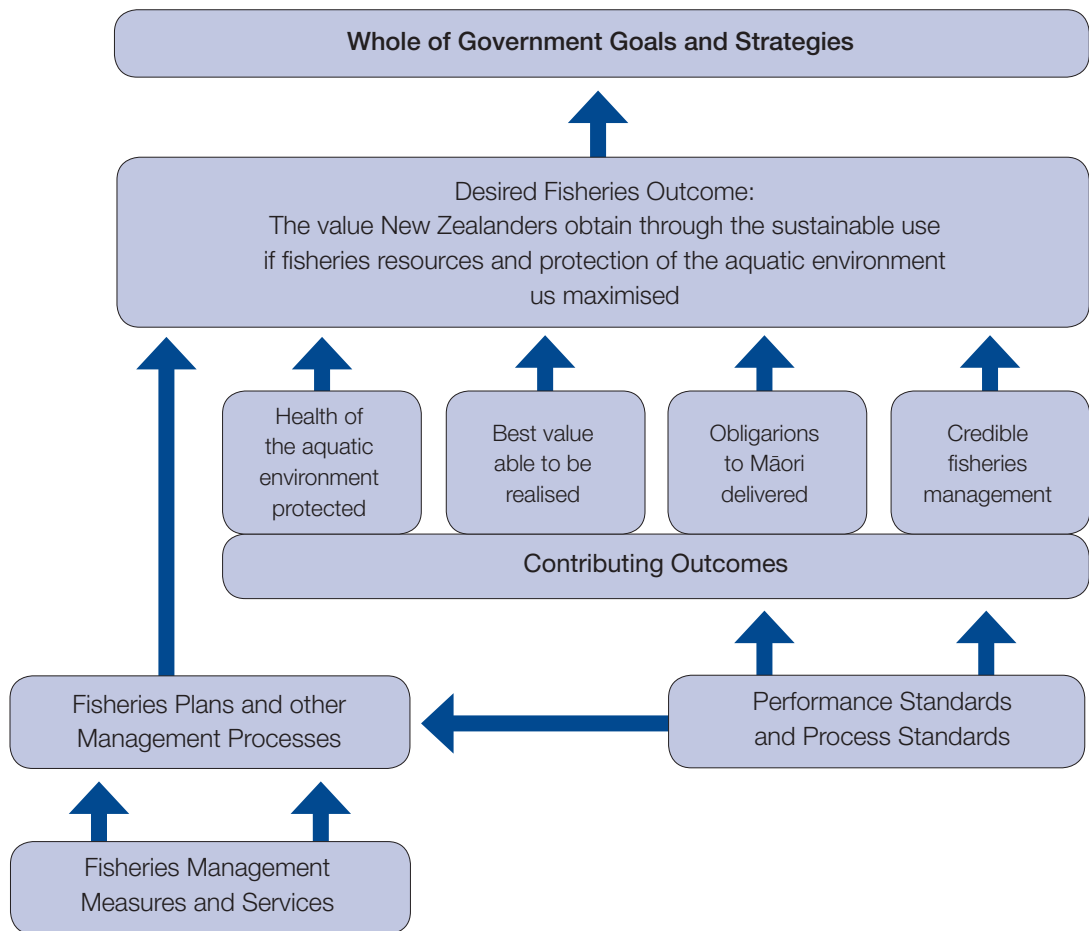


Figure 1. The role of standards in the government’s approach to fisheries management, as signalled in the Statement of Intent 2005/2008

1.3 Scope

The scope of this Strategy is management of the adverse effects of fishing on the aquatic environment. The term fishing refers to commercial, customary and recreational fishing. The Ministry of Fisheries has management responsibility for fisheries in both marine and freshwater environments. The policies contained in this Strategy are applicable to the adverse effects of all fishing (excluding fishing for whitebait, salmon and trout, which are managed under conservation legislation). Most fishing activity for which the Ministry of Fisheries has management responsibility occurs in the marine environment and, therefore, the primary focus of the Strategy is also the marine environment.

This Strategy is applicable to all fishstocks, whether managed in the QMS or not, and whether considered target, bycatch, or incidentally affected by fishing. Management of stocks in the QMS will normally occur within standards relating specifically to target fish stocks (developed elsewhere); environmental standards described in this Strategy will normally apply only to effects of fishing on other parts of the aquatic environment.

This Strategy does not directly address biosecurity, aquaculture, or non-fisheries effects (e.g., run-off from land based activities, and climate change), all of which can have adverse effects on the aquatic environment. These matters are addressed elsewhere, as indicated in Table 1.

	Issue	Responsibility
In Scope	Effects of commercial, customary and recreational fishing on all elements of the aquatic environment.	This Strategy
Out of Scope	Effects of fishing for whitebait, salmon and trout	Department of Conservation
	Effects of aquaculture	Regional Councils
	Adverse effects associated with general marine industries and activities e.g. fuel spills and general discharges from vessels	Maritime New Zealand; Regional Councils (within 12 NM of the coast); Department of Conservation
	Biosecurity	Ministry of Agriculture and Forestry
	Land-based effects on the aquatic environment e.g. sedimentation; nutrient run-off	Regional Councils; future Oceans Policy

Table 1. Scope of this Strategy

1.4 Terminology

The different elements of the marine environment affected by fishing can be categorised in different ways depending on the requirements of managers and resource users. Examples of categories include: protected species, associated or dependent species, habitat, trophic interactions, marine biodiversity, genetic diversity, non-target species etc. In this Strategy the term “species and habitats” is used as shorthand to refer to all the elements and relationships within the aquatic environment that may be affected by fishing. For example, setting a standard to limit the effect of fishing on a particular species will include consideration of the species’ role in the ecosystem in which it occurs.

1.5 Key Changes

This Strategy builds on existing Ministry of Fisheries management approaches and contributes to existing processes. However, in some areas, the Strategy signals important changes in the way the Ministry of Fisheries will address environmental issues. The Strategy:

- Emphasises the need to assess the effects of fishing on all parts of the aquatic environment, not just respond to obvious adverse effects.
- Establishes environmental standards as the key mechanism for defining acceptable limits of the effects of fishing on the aquatic environment.
- Emphasises the role of government-set standards for managing effects of fishing while providing flexibility for how the standards are achieved.
- Identifies key stages for setting environmental standards in a transparent and clearly defined way.
- Identifies key factors to be considered in setting environmental standards.
- Provides for social values, including Māori values, to be incorporated into setting environmental standards.
- Provides for efficient and effective stakeholder participation.
- Establishes a requirement for fishery managers to demonstrate that a fishery is meeting environmental standards.
- Encourages coordination of aquatic environment research and management initiatives.

1.6 Principles

Drawing on the Fisheries Act 1996, the Ministry of Fisheries Strategic Plan 2003-2008, the approach to fisheries management set out in the Ministry of Fisheries Statement of Intent 2005-2008, and other environmental instruments and international agreements, it is possible to identify principles relevant to managing the environmental effects of fishing. These principles should guide the implementation of this Strategy in terms of overall approach, process design and operation, and decision-making. They should also provide the basis for the monitoring framework that will be used to assess the effectiveness of the Strategy.

A number of generic principles, which should influence the Strategy as a whole, are set out below. Other, more specific, principles are listed at the beginning of the relevant sections of the Strategy. Principles relevant to the Strategy as a whole are:

- Avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment.
- Give effect to the purpose of the Fisheries Act 1996 (to provide for the utilisation of fisheries resources while ensuring sustainability), and the overall fisheries outcome set out in the *Ministry of Fisheries Statement of Intent 2005–2008* (value is maximised).
- Meet New Zealand's international obligations.
- Clearly define roles, responsibilities, and accountabilities.
- Adopt a "learning culture" to support improvement of environmental effects management over time.
- Use best available information.
- Take into account wider (non-fisheries) New Zealand government priorities.
- Monitor and assess effects of fishing on an ongoing basis.

2.0 Framework to Manage the Environmental Effects of Fishing

2.1 Introduction

This section outlines the components of this Strategy. At the Strategy's core are environmental standards, set by Government with input from tangata whenua and stakeholders. Environmental standards will specify the limits of acceptable effects of fishing on the aquatic environment. Management of fisheries—both through ad hoc measures and, increasingly, through fisheries plans, will be required to meet the standards. Monitoring is important to assess the effectiveness of the Strategy in achieving the Government's desired outcomes. Information, and input from tangata whenua and stakeholders, are important components of the Strategy, and links with other environmental initiatives will help ensure efficient and coordinated management of the aquatic environment.

The key elements of this Strategy are shown in Figure 2. In the remainder of this section, each of the key components of the framework is described and a more detailed description of environmental standards is contained in Section 3.0.

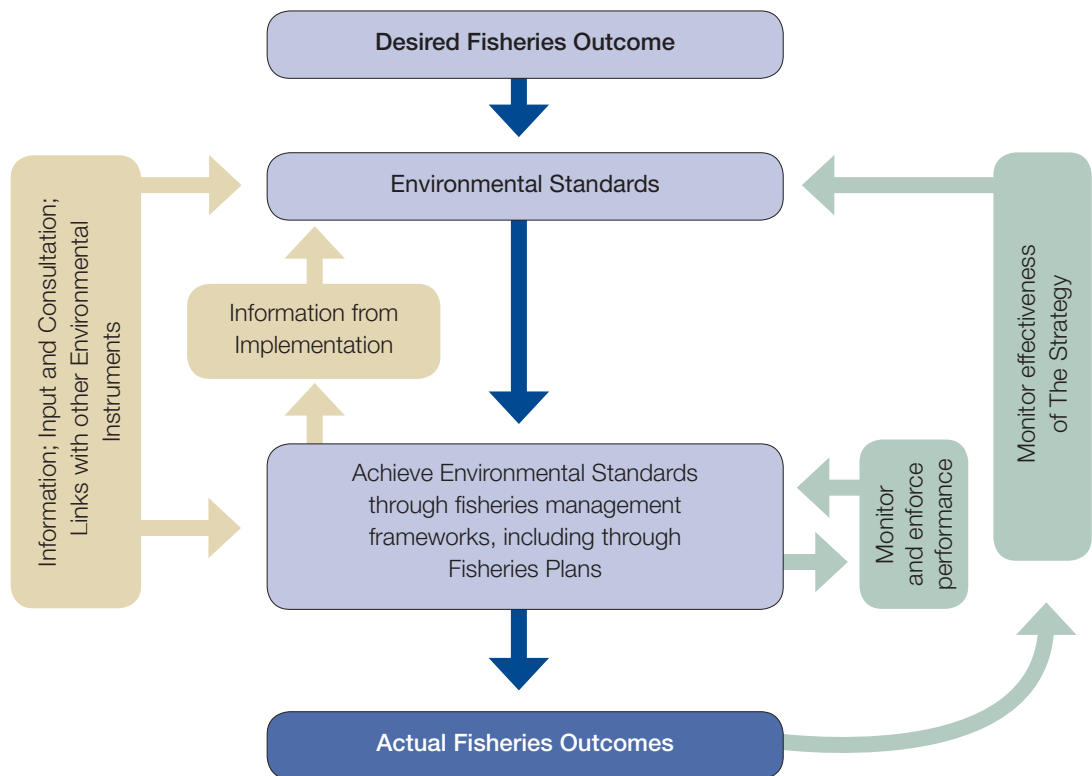


Figure 2. Framework for Managing the Effects of Fishing on the Aquatic Environment

2.2 Setting Environmental Standards

2.2.1 Principles

Key principles relevant to the setting of environmental standards are:

- Prioritising species and habitats for the development of standards should be based on analysis of risk-including consideration of probability, impact, reversibility, information availability, and tangata whenua and stakeholder concerns.
- Processes for setting environmental standards should incorporate consideration of environmental factors and social values.
- The degree of caution exercised in determining biological limits should take into account the nature of available information.
- Tangata whenua and stakeholders should have opportunity to contribute to the development of standards.
- An adaptive approach should be taken to setting standards, particularly where information is uncertain.
- Where practicable, standards should be designed to allow flexibility in the mechanisms by which the standards can be achieved.
- Compliance and enforcement costs should be considered when determining the nature of environmental standards.

2.2.2 Overview

This section provides background on environmental standards and outlines the process by which they should be developed. A description of environmental standards is provided in Section 3.0.

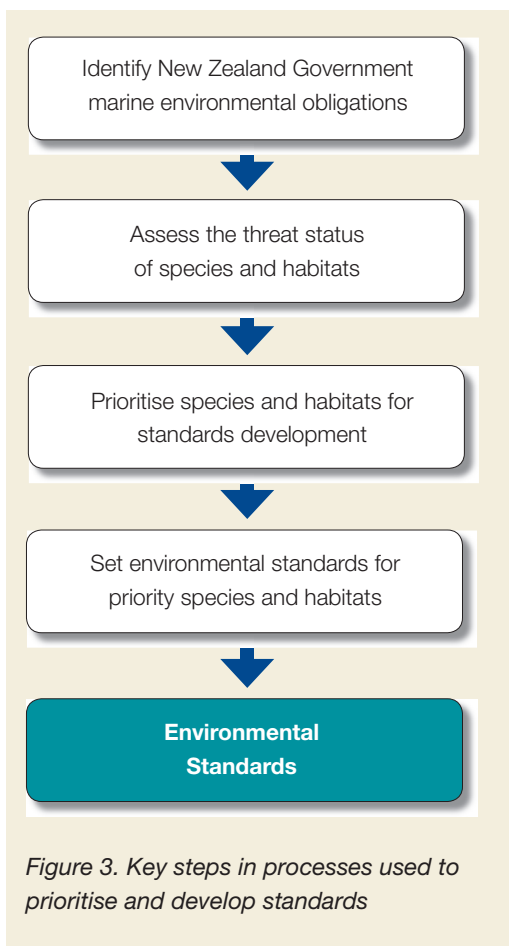


Figure 3. Key steps in processes used to prioritise and develop standards

Environmental standards define the point at which the effects of fishing on an element of the aquatic environment moves from being acceptable to unacceptable, or adverse. Currently, there are few explicit limits on the effects of fishing, although the purpose and environmental principles of the Fisheries Act 1996 provide high-level guidance. The proposed fisheries outcomes currently being developed by the Ministry will provide further guidance. It is also possible to infer some limits of acceptable effects from decisions made by the Minister of Fisheries to limit the environmental effects of fishing. However, tangata whenua and stakeholders have little certainty about how the Government will respond in any particular situation. The use of environmental standards to specify acceptable limits of the effects of fishing will provide greater transparency, enhance the consistency of decision-making, and provide tangata whenua and stakeholders with greater certainty to be able to plan, and to invest and participate in fisheries, and clearer opportunities to participate in determining acceptable limits.

Individual environmental standards should apply over a geographic area appropriate for the species or habitat that the standard is designed to limit the effects of fishing on-and should apply to all fisheries operating in that area. Relevant geographic areas might range from the whole Exclusive Economic Zone for a wide-ranging seabird species to relatively small areas for a particular habitat. Where a number of different fisheries affect a particular non-target species or habitat, managers of the different fisheries will need to cooperate to ensure that the

aggregate effect on the species or habitat remains within the relevant standards.

Setting environmental standards will require careful consideration of environmental obligations, value from utilisation of fisheries, social values, and the foreseeable value for future generations. Some of these factors cannot be maximised simultaneously and, therefore, trade-offs must be made. Responsibility for making those trade-offs and determining environmental standards lies with the Minister of Fisheries, although input from tangata whenua and stakeholders will be an important factor. Provision for input by tangata whenua and stakeholders will help ensure that their views are properly considered when environmental standards are set and that a broad range of possible options for standards is considered. Especially where information is uncertain, standards should be set in an adaptive manner, with standards being adjusted to reflect the results of monitoring the implementation of initial standards.

Environmental standards will, at least initially, take 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 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 special circumstances indicating that the policies should not be followed in that particular situation.

2.2.3 Setting Standards

A variety of processes could be used to prioritise and set standards but there will be key steps common to all processes. Figure 3 shows the key steps, which are discussed below.

Stage 1: Specify Environmental Obligations

Environmental standards should accurately reflect the environmental obligations they are intended to contribute towards. Therefore, it is important that such obligations are clearly understood by all involved in managing fisheries, and are updated as required. Sources of obligations include relevant international agreements, legislation, ministerial decisions, and Government policies.

Stage 2: Assess Threat Status

It is important to identify those species and habitats on which fishing activities are having an adverse effect or pose a risk. The identification of species and habitats at risk from fishing should be based on information including:

- i. Reviews of current information about habitats and species potentially affected by fisheries.
- ii. Targeted research into the effects of fishing on particular species and habitats.
- iii. Environmental impact assessments to be undertaken in respect of each fishery, either in the context of fisheries plans or through other management processes.
- iv. Input from tangata whenua and stakeholders.

Stage 3: Prioritise Standards Development

It is impractical and unnecessary to develop environmental standards for all species and habitats immediately. Initially, standards should be developed for those species and habitats considered to be at highest actual or potential risk from fishing. The system of prioritisation should be based on the level of risk to each species and habitat, including consideration of the likelihood of an adverse effect, the severity and reversibility of the effect, and the nature of available information. The resulting list of habitats and species that require standards, ranked in terms of the urgency of action required, should be updated periodically to include assessment of additional species and habitats, new information, and new priorities.

Stage 4: Set Environmental Performance Standards.

This stage should result in one or more standards being established for each high priority species and habitat. The standards will specify the point at which an effect of fishing on that species or habitat becomes adverse. The factors that should be considered when setting environmental standards include biological limits, societal views on current use (which includes consideration of tangata whenua views, and utilisation values) and the needs of future generations. Further details of these considerations and their application are discussed in Section 3.

2.3 Managing Fisheries to Achieve Environmental Standards

2.3.1 Principles

The key principles relevant to managing fisheries to meet environmental standards are:

- The onus to demonstrate that the effects of fishing are within environmental standards should be on those responsible for managing the fishery.
- Environmental impact assessment (EIA) methods should consider all effects on habitats and species and be consistent across fisheries.
- Implementation of management measures should be verifiable and monitored.
- Determination of management measures necessary to meet environmental standards should take into account the views and interests of tangata whenua and stakeholders.

2.3.2 Overview

It is envisaged that, over time, the process of managing fisheries to achieve environmental standards will occur primarily through fisheries plans prepared by the Ministry of Fisheries in consultation with tangata whenua and stakeholders. Fisheries plans will specify what the government, tangata whenua, and stakeholders want to achieve for specific fisheries, and associated implementation strategies and services (including research, regulations, and compliance) to achieve the objectives. Until fisheries plans are prepared for all fisheries, standards will be implemented through current Ministry processes for developing management interventions. Priority should be given to undertaking EIAs in fisheries considered to most likely to result in adverse effects to the aquatic environment.

This section describes how it is envisaged fisheries will be managed through fisheries plans to achieve environmental standards. In particular, it describes the process that fisheries managers should use to identify relevant standards and coordinate, as required, with managers of other fisheries to manage the fishery to achieve the required standards.

2.3.3 Identifying Relevant Standards and Appropriate Response

There are three main stages in the process a fishery manager should use to identify environmental standards relevant to a fishery and determine the appropriate management response:

- i. Assess environmental impacts and identify relevant standards
- ii. Determine the aggregate effect of all relevant fisheries
- iii. Implement management measures, as required

Each of the stages is described in more detail below.

i. Assessment of Fishery Effects.

This stage should be undertaken on a fishery-by-fishery basis by the fishery manager. An environmental impact assessment should be undertaken for each fishery to identify the species and habitats affected by the fishery. This assessment would be used in two ways. First, it will inform the risk assessment process by which species and habitats requiring standards as a high priority are identified. Second, it will provide the necessary information for fishery managers (Ministry of Fisheries managers, and stakeholders-to the extent that they are responsible for managing relevant aspects of their fishing operations) to determine which environmental standards are relevant for the fishery.

Fishery managers should then assess the effect of the fishery on species and habitats for which standards have been determined.

ii Assessment of Aggregate Effects of All Relevant Fisheries

For each species or habitat for which there is a relevant environmental standard, information about the effects of all fisheries should be considered to determine the aggregate effect of fishing on the species or habitat. Where only one fishery affects a particular species or habitat, the aggregate effect would be the same as for that one fishery. The aggregate effects of all fisheries that impact on the species or habitat should be assessed against the environmental standard. In respect of each standard, the total effect of fishing may be:

- **Not Adverse.** The aggregate effect is within the limits established by the environmental standards.
- **Adverse.** The aggregate effects of fishing are known to breach the limit established by the environmental standard.
- **Insufficient Information.** There is insufficient information to establish whether the aggregate effects of fishing are within an environmental standard.

iii Planning Management Response to Meet Standards

Different management responses will be required, depending on the assessment of the aggregate effect of fishing.

Where the overall effect of fishing is not adverse, no additional management measures will be required. Fishery managers should be required to continue monitoring the effect of the fisheries so that periodic assessments can be undertaken to ensure that the aggregate effect of the different fisheries remains within the environmental standard.

Where the aggregate effect of fishing is adverse, management measures should be implemented to ensure that the aggregate effects of fishing are not adverse. Where a species or habitat is affected by only one fishery, the managers of that fishery should be required to demonstrate how management of the fishery will be changed to meet the standard(s) applicable to that species or habitat. Where more than one fishery affects a species or habitat, coordination between the managers of those fisheries would be required to ensure that the relevant standards are not exceeded. This may require apportioning a limit between the relevant fisheries or by reaching agreement to operate in a consistent manner to meet the standard (e.g., to refrain from fishing in particular areas to protect a habitat type). There is scope for market mechanisms to be used to help ensure that allowable effects are allocated between fishers in an optimal manner.

Managers of relevant fisheries would be responsible for proposing interventions necessary to ensure the limits determined for the particular fishery are achieved. Fishery managers will also need to continue to obtain sufficient information to demonstrate that the combined effects of all relevant fisheries meet the environmental standard.

Where there is insufficient information to demonstrate that the effects of a fishery on a part of the aquatic environment are not adverse, different strategies could be employed. Further management measures could be implemented (e.g., by not fishing in an particular area) so that, with the available information, it can be demonstrated that the effect of the fisheries is not adverse. Alternatively, more precise information could be obtained to allow an assessment of whether or not the aggregate effect of the fisheries under current management arrangements is adverse. Depending on the time required to obtain the additional information, it may be necessary to implement interim management measures to reduce the effects of fishing. A combination of both approaches might be chosen. As above, coordination between managers of relevant fisheries will be required.

2.3.4 Managing Fisheries to Meet Environmental Standards

A wide range of management tools is available to fishery managers to achieve environmental standards, including output controls, individual limits, input controls, economic incentives, and codes of practice. These will be developed through fisheries plans and other management processes, and are not discussed in detail in The Strategy. An important element of The Strategy is that fishery managers should have flexibility to use cost-effective management tools, while ensuring that desired outcomes are achieved.

2.4 Information, Inputs, and Linkages

2.4.1 Overview

The third component of the framework is focused on the inputs to the process of managing the effects of fishing, and linkages with related initiatives. It covers:

- Information necessary to support decision-making
- Participation, input, and consultation with tangata whenua, fishery stakeholders, and the public respectively
- Linkages with related information and management initiatives

2.4.2 Information

This Strategy sets out a new approach to managing the environmental effects of fishing. Currently, management reacts to concerns about the effects of fishing on particular species and habitats after the effects have become a concern. The Strategy proposes regular assessment of the status of species and habitats affected by fishing, and the development of environmental standards for those species and habitats for which the effects of fishing need to be constrained.

In terms of information requirements, this new approach 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 may also lead to stakeholders seeking more information on harvest methods that cause fewer affects on aquatic ecosystems. 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 build our understanding of aquatic ecosystems, over time, and 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.

2.4.3 Partnership, Participation and Consultation

Principles:

- Accurate and quality information should be provided to the decision-making authority to achieve the informed consideration of stakeholder views and make the relevant tradeoffs
- All organisations and individuals with an interest in particular issues should have an appropriate opportunity to interact and present information relevant to the issue.

The Ministry of Fisheries is required to consult with fisheries stakeholders in respect of sustainability measures and also has a particular obligation to provide for input and participation by tangata whenua. This Strategy is designed to provide for effective participation by tangata whenua and stakeholders in managing the effects of fishing on the aquatic environment. Use of standards to specify how the environmental effects of fishing should be managed will allow tangata whenua and stakeholders to focus their involvement on the standard setting process rather than having to be involved in all aspects of the fisheries management process.

Some parts of the environmental standard setting process will be primarily technical and require significant scientific expertise; other parts of the process will be more reliant on tangata whenua and stakeholder input-including treatment of risk and uncertainty, and the limits to acceptable effects of fishing on different species and habitats. There should be provision for input by tangata whenua and stakeholders throughout the standard setting process. MFish will make information on managing the environmental effects of fishing available to the public and provide opportunities for members of the public not affiliated with a particular stakeholder group to provide input to management processes

2.4.4 Links with Related Initiatives

Principles

- Decision makers should take into account other relevant management initiatives (including from other sectors).
- Implementation of this Strategy should be linked to other relevant Ministry of Fisheries policy and management initiatives to ensure an integrated approach.
- All available and relevant research information should be utilised when assessing effects on species and habitats and when setting standards.
- Where practicable, standards set under this Strategy should take into account other relevant management initiatives-both within and outside the fisheries sector.

There are many government and non-government instruments and initiatives addressing different aspects of managing effects on the aquatic environment. They include:

- Draft Oceans Policy
- New Zealand Biodiversity Strategy
- Marine Protected Areas Policy Statement and Implementation Plan
- Marine Environment Classification project
- Marine Reserves Act 1971
- Marine Mammals Protection Act 1978
- Wildlife Act 1953
- WWF Marine Ecoregion Initiative
- Southern Seabird Solutions
- WWF/SeaFIC/TOKM/MfE: Sustainable Fisheries Guide. Environmental management tools for New Zealand Fisheries, including an environmental check list.
- Seabird National Plan of Action
- Draft Seamount Strategy
- National Aquatic Biodiversity Information System (NABIS)
- Ministry of Fisheries Aquatic Environment Medium Term Research Plan
- Conservation Services Levy Research Programme

This Strategy is focused on addressing Fisheries Act obligations but, to be cost-effective, it must take into account other relevant initiatives. There are two key ways in which coordination should take place: obtaining information and implementing management measures.

A number of other initiatives generate information of relevance to this Strategy. An example is the Conservation Services Levy research (for which costs are recovered from the seafood industry). If this information were not available to inform the setting of environmental standards, information would likely need to be obtained through other sources.

The Ministry of Fisheries is not responsible for managing effects of non-fishing activities on the aquatic environment, but it needs information on those effects to manage fisheries and the effects of fishing. Coordination between the Ministry of Fisheries and agencies responsible for managing non-fishing activities will be necessary to ensure that necessary information is made available.

Some initiatives not related to the Fisheries Act result in management measures that contribute to meeting Fisheries Act obligations. For example, cable protection zones are established to protect undersea cables from damage by fishing and shipping activities. Incidentally, they also protect significant areas of benthic habitat from the effects of fishing. Similarly, by protecting areas from the effects of fishing, marine reserves contribute to meeting obligations in the Fisheries Act. Taking into account the contribution these other management measures make towards meeting Fisheries Act obligations will avoid unnecessary duplication and avoid unnecessary constraints on the activities of fishers.

2.5 Monitoring and Reporting

2.5.1 Principles

The key principles relevant to monitoring and reporting are:

- Where possible, monitoring of performance should be against agreed outcomes and standards; where this is not practicable, agreed proxies for the outcomes should be used.
- Monitoring systems should meet minimum requirements to ensure effective monitoring and maintain the confidence of tangata whenua and stakeholders.
- Monitoring should be used to inform the continued development of the Strategy.
- The results of monitoring should be presented in a manner accessible to tangata whenua and stakeholders.

2.5.2 Monitoring

Monitoring and periodic review of the Strategy is required to ensure that it is effective and remains relevant to fisheries management and environmental concerns. To do this in a meaningful way the monitoring should to be conducted at three levels:

- i. Implementation of the Strategy
- ii. Performance against the environmental standards
- iii. Environmental Outcomes

Each level of monitoring is outlined in this section.

An assessment of implementation of this Strategy should be based around whether the processes described in the Strategy have been developed and utilised in accordance with process standards. A monitoring framework, based on the principles outlined in this Strategy, should be developed to provide a clear and accountable monitoring system.

Monitoring of performance against the environmental standards should focus firstly on the implementation of the standards and secondly on the levels of compliance with the standards. The types of indicators that should be considered include:

- Number of species and types of aquatic habitat adversely affected by fishing for which information is being collected.
- Number of species and types of aquatic habitat considered at risk from the effects of fishing for which environmental 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.

Monitoring of standards should include consideration of the type of information by which compliance with standards is measured.

There are currently few measures by which the effectiveness of this Strategy in achieving desired environmental outcomes could be assessed. Existing measures should be used, where possible, and new measures developed as part of the implementation of this Strategy, and the wider development of fisheries outcomes signalled in the Ministry Statement of Intent. Where possible, measures should be based on information that is already collected. Where insufficient information is currently collected, new information gathering systems should be considered.

2.5.3 Reporting

A central focus of the Strategy is the requirement to provide increased transparency and accountability to the standards setting process. The structure and systems required to do this are outlined in this Strategy. Without effective reporting it is unlikely that the potential benefits from this Strategy will be fully realised. Reporting on both the implementation and outcomes of the Strategy is a precursor to effective input and participation from tangata whenua, stakeholders, and the wider New Zealand public.

3.0 Environmental Standards

3.1 Overview

This section describes the factors that should contribute to setting standards relating to the effects of fishing on the aquatic environment-including biological limits and current and future use considerations-and the nature of the standards.

3.2 Factors Contributing to Environmental Standards

Before determining standards relating to fishing, decisions must be made on how the effects of non-fishing activities will be addressed. Fishing is not the only human activity that affects the aquatic environment. Other activities include exploration for and extraction of oil and minerals, dumping dredge spoil and other material, reclamation, aquaculture, and land-based activities that cause run-off into the aquatic environment.

Fishing and non-fishing effects on the aquatic environment are shown diagrammatically in Figure 4. The horizontal axis represents the proportion of the species or habitat that is affected by human activities. For a particular habitat type, at the left hand end of the diagram, 0% would represent a habitat type that has not been affected in any way by fishing or other human activities. At the right hand side of the diagram, 100% would represent a situation where all of the habitat type has been destroyed by fishing or other human activities. For a particular species, 0% would represent a situation where fishing and other human activities has no effect on the species and 100% would represent a situation where the species has become extinct as a result of human activities.

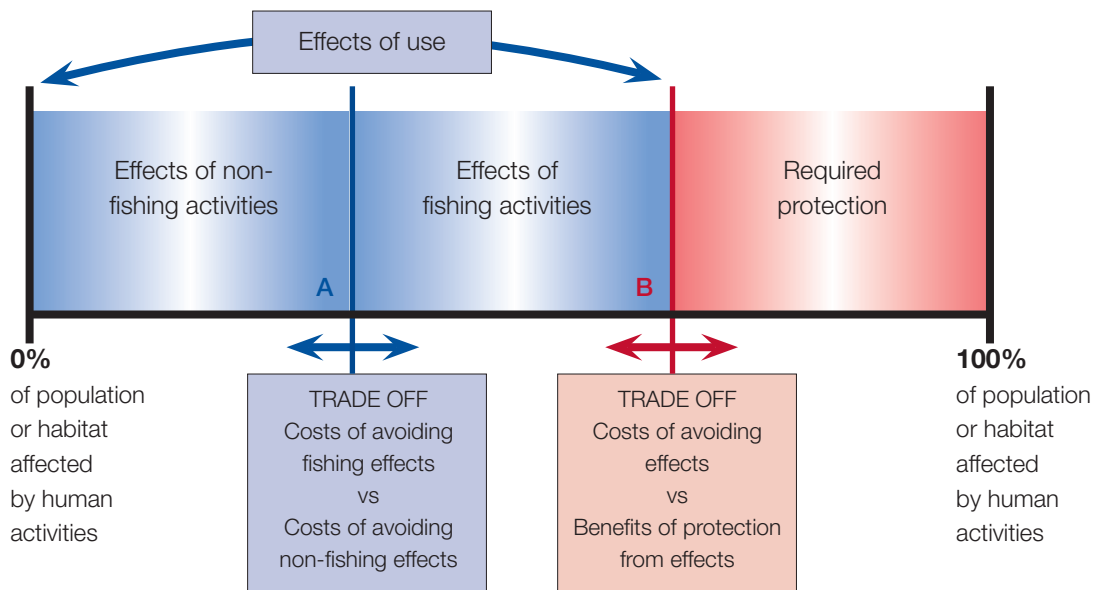


Figure 4. Fishing and non-fishing effects on the aquatic environment

In Figure 4, the area to the left of the line at A represents the effects of non-fishing activities on a particular species or habitat. The area between the lines at A and B represents the effects of fishing activities. The area to the right of the line at B is the amount of the species or habitat that should be protected from the effects of fishing or other human activities. Determination of the appropriate position of B is discussed later in this section.

The effects of non-fishing activities must be taken into account when determining acceptable effects of fishing activities, but cannot be controlled by fishery management tools. Ideally, where a species or habitat is affected by fishing and non-fishing activities, all activities would be managed so as to ensure that the overall effect is acceptable. It would be in New Zealand's interest to optimise the "use" of an acceptable effect on a species or habitat across fishing and non-fishing activities. Currently, there are no formal frameworks within which such cross-sector value optimisation can occur but it is expected that that Oceans Policy may go some way towards establishing such a framework. For the purpose of this Strategy, the effects of non-fishing activities are taken as "givens", although recognising the effects of non-fishing activities in this Strategy will help identify where value is not optimised between sectors.

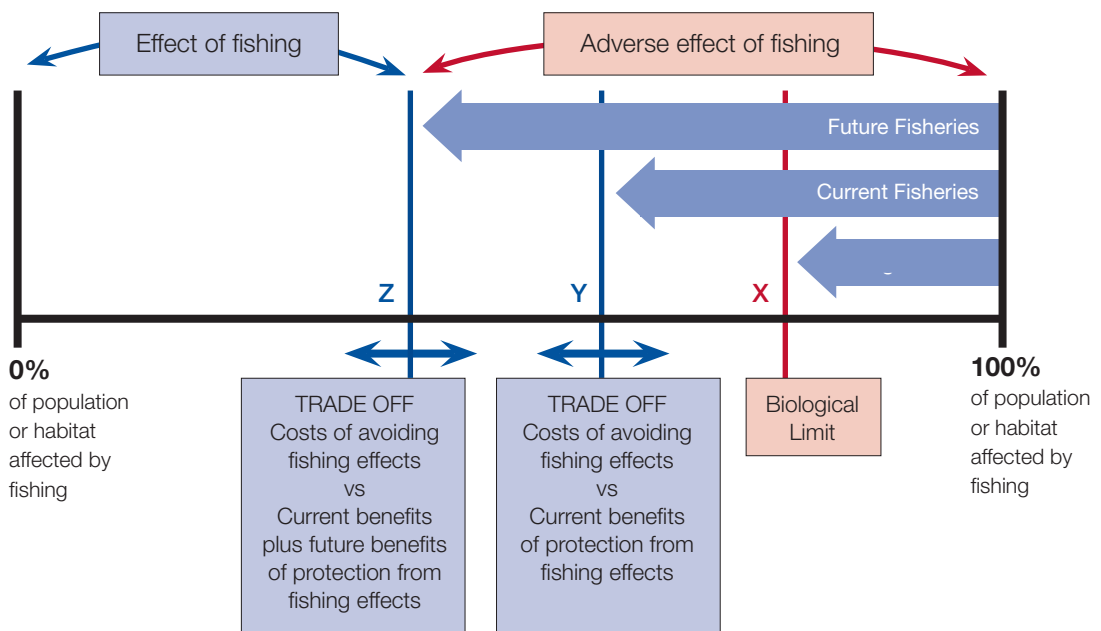


Figure 5. Determination of the point at which an effect of fishing becomes adverse

Figure 5 focuses on the effects of fishing and shows the different factors that should be considered when determining the point at which an effect of fishing becomes adverse. In this figure the horizontal axis represents the proportion of the species or habitat that is affected by fishing activities. Each of the key components of the framework is discussed in this section.

There are two important assumptions underlying this framework. First, some effects of fishing on some species and habitats may not be "adverse". For such "non-adverse" effects, there is no requirement for fishers to avoid, remedy or mitigate the effect. (It should be noted that for some species an effect may be adverse at all levels greater than zero.) Second, determination of the point at which an effect becomes adverse includes both biological and social factors.

The vertical line at Z represents the point at which an effect is deemed to be adverse. Below this, the effect is acceptable; above this point the effect is unacceptable. The position of this line will be determined by one of three factors:

- Biological limits
- Trade-off between current fishing use and non-use
- Trade-off between current fishing use and future use

Each of the three factors is described later in this section.

These three factors are distinct from each other and their influence on the final point is not cumulative. The point at which an effect is deemed to be adverse is determined by whichever of the three factors requires the lowest level of effect on the species or habitat. For the species or habitat represented in Figure 5, the point at which an effect becomes adverse is determined by the outcome of the trade-off between current use and future use. Depending on the type of species or habitat involved, any one of the three considerations may determine the point at which the effect becomes adverse. The way in which this limit should be applied to the setting of environmental standards is discussed later in this section.

For many species and habitats, it will be difficult to determine the contribution of each of the three factors with much precision. However, considering each of the factors separately will provide greater transparency and encourage more focused debate on the level at which an effect of fishing should be considered adverse.

The Fisheries Act 1996 is the primary consideration in setting environmental standards, but other Government obligations in respect of the aquatic environment may be relevant for particular species or habitats.

3.3 Biological Factors

The biological limit is the limit on an effect of fishing necessary to meet agreed fisheries outcomes in a manner consistent with the Fisheries Act 1996. The environmental principles contained in section 9 of the Act are:

All persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following environmental principles:

- a) *Associated or dependent species should be maintained above a level that ensures their long term viability:*
- b) *Biological diversity of the aquatic environment should be maintained:*
- c) *Habitat of particular significance for fisheries management should be protected.*

Minimum biological requirements incorporate considerations of the sustainability of a particular species or habitat and also the role of the species or habitat in the functioning of the ecosystem in which it occurs. For example, the biological limit for a species such as the pilchard would include considerations both of the sustainability of the pilchard stock and also the contribution that this stock makes as a source of food for seabirds.

An assessment of risk posed to a species or habitat will be an important component of determining the biological limit. Since there is much uncertainty concerning the minimum biological requirements for some species and habitats, consideration of the information principles set out in section 10 of the Fisheries Act, will be important.

There are a variety of reference points relevant to population sizes that can be used to determine biological limits (e.g., minimum percentage of unfished biomass). However, there are few established biological reference points applicable to habitats. Where such biological reference points can be developed, they should be used. In the absence of relevant biological reference points it is proposed that the reversibility of an effect of fishing should be used as the primary determinant of the point at which an effect of fishing on a habitat type become adverse. In effect, this would see minimum requirements to provide for future generations (discussed in Section 3.5) being used as a proxy for biological reference points.

Where an effect of fishing on a habitat type is reversible in a short period (e.g., within one year), it is proposed that it should only be necessary to protect a small amount of the habitat from that effect of fishing. Where an effect of fishing on a habitat type is reversible only over a long period—especially periods longer than a number of human generations—or is irreversible, a larger amount

of that habitat should be protected from that effect of fishing. Required levels of protection of habitats from effects with intermediate periods of reversibility should be determined on a linear basis between these two extremes. A schedule of periods of reversibility and the corresponding levels of required protection should be prepared as a priority.

Determining the biological limit for a species or habitat should be based primarily on technical information. It should not be subject to trade-offs with current use. Input by tangata whenua and stakeholders will be important in determining how risk analysis should be undertaken and information principles applied.

The biological limit—shown as the vertical line at X in Figure 5—represents a “bottom line” beyond which effects of fishing are deemed unacceptable, based on sustainability considerations. In effect, it represents the boundary of the scope for the trade-offs based on current and future use.

3.4 Current Use

For some species and habitats, there may be no requirement to further constrain the effects of fishing below what is required to meet biological requirements. For these species and habitats this level (labelled as Y in Figure 5) would occur at the same point as the biological limit (labelled X).

For other species and habitats, the point at which an effect becomes adverse will be more conservative than the biological limit described above. For these species and habitats, society wants the effects of fishing to be constrained below the level that would meet biological requirements.

Common dolphins provide a simple example. Some common dolphins are killed in trawl fisheries, despite attempts by fishers to reduce the effect of their fishing activities on dolphins. The current level of incidental mortality is not considered to pose a significant danger to the overall dolphin population and higher levels of mortality would probably not pose a danger either. However, the fact that the “biological limit” for dolphin mortality is probably higher than current mortality levels does not mean that fishers should be allowed to relax their efforts to reduce incidental dolphin mortality in their fishing operations. Society has made it clear, through the legislative process, that any incidental dolphin mortality is undesirable and that efforts should be made to minimise incidental mortality.

Determining the point at which an effect becomes adverse requires careful balancing of the costs of eliminating or reducing the effects of fishing on the habitat or species (i.e., cost involved with changing or constraining fishing practices) and the current benefits produced from the protection of the species or habitat from the effects of fishing (i.e., the additional value to today’s society from the resulting improvements in the habitat or species). Since there are often very different views on the appropriate point at which an effect becomes adverse, such trade offs are usually made at a political level.

The Fisheries Act 1996 provides discretion for decision-makers to determine the point at which effects become adverse, but little specific direction in this matter. General guidance is provided by the purpose of the Act (“to provide for the utilisation of fisheries resources while ensuring sustainability”) and the definition of utilisation (“conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being”). Additional guidance is provided in the *Ministry of Fisheries Statement of Intent 2005-2008*, in which the overall outcome is: *The value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment is maximised*, and “value” is described to include:

- The value to present and future generations of preserving the structure, function, and biodiversity of our aquatic environment.
- The value to Maori of sustainable aquatic resources and a healthy aquatic environment.
- The value gained from the pleasure of fishing for recreation.

- The value of a thriving seafood industry
- The value of flourishing communities with a strong fisheries sector at their heart.

Consistent with this guidance, it will be important to give careful consideration to the benefits and costs of the point at which an effect of fishing is determined to be adverse. Some of these values, costs, and benefits will be non-monetary in nature and comparing them will be difficult. There should be opportunity for tangata whenua and stakeholders to contribute to assessment of values, costs, and benefits, and to provide input to determining the appropriate balance between current use and protection.

3.5 Future Use

Future generations are likely to value use of fisheries resources and the aquatic environment differently than current generations and, therefore, it can be expected that their determination of the acceptable effects of fishing will also be different. The mandate to provide for use by future generations is contained in the definition of “sustainability” in the purpose of the Fisheries Act 1996 and is consistent with other natural resource management legislation and the Government’s 2003 Sustainable Development Programme of Action.

For some species and habitats, the need to provide for future generations may require defining the point at which an effect becomes adverse at a more conservative level than is required to meet biological limits and balance current use and protection. In Figure 5, this is shown as the line at Z. The need to set a more conservative limit to provide for future generations will typically only occur for species and habitats for which the effects of fishing are either irreversible or reversible only over long periods. Where effects are reversible within a short period—particularly within a human generation—the choices of future generations about acceptable effects are not constrained by current decisions on acceptable effects. For these species and habitats, Z would occur at the same point as Y.

Where an effect is irreversible, or only reversible over long periods, careful consideration of possible requirements of future generations is required. Where these may be different from acceptable effects based on an assessment of current use and protection requirements, a trade-off must be made between current use and future use. This trade-off will involve a calculation of the costs of eliminating the effects of fishing on the habitat or species and the total benefits to current and future generations from the protection of the habitat or species from the effects of fishing.

This trade-off is complicated by the fact that, by definition, preferences of future generations are unknown. Tangata whenua and stakeholder input will be important when making trade-offs between future and current use.

3.6 Nature of Environmental Standards

Environmental standards should be set in respect of each species or habitat considered to require protection from the effects of fishing. Each standard will require information to allow fishery managers to manage fisheries to meet the standard and the Ministry of Fisheries to assess whether the standard has been met. The information requirements are:

- The species or habitat to which the standard applies
- The geographic area over which the standard applies
- The metric by which the standard is to be measured
- The point on the metric at which an effect becomes unacceptable
- The level of precision by which effects must be shown to be within the standard (may include both levels of compliance and precision of reporting)
- The action(s) that will be taken if the standard is exceeded (may include closing a fishery or imposition of a penalty)

Standards may be presented in different ways depending on factors such as:

- Appropriate spatial scale
- Specificity required
- Required level of compliance
- Maximising flexibility

Spatial Scale

Environmental standards may apply at different scales depending on the nature of the species or habitat to be protected. For example, if a species is wide-ranging, such as some seabirds, it may be appropriate for a single standard to apply across all New Zealand fisheries waters in respect of that species. However, standards would apply over much smaller scales for species that are highly localised.

Where standards are applied to protect habitats from the adverse effects of fishing, they are likely to be applied at spatial scales smaller than the total extent of the particular type of habitat. For example, if a particular rare habitat type occurs in small amounts in two distinct areas, it is expected that at least some of the habitat would be protected in each area.

Specificity

Standards can be specified at different levels of detail. Where it is in fishers' interests to ensure an adequate level of protection of species and habitats, it may be appropriate to express environmental standards in a less prescriptive form. However, where there are no obvious incentives for fishers to ensure adequate protection of species and habitats, it is appropriate for the Government to specify environmental standards in more detail—to ensure desired outcomes are achieved.

Applying the Determination of Adverse Effects

As indicated earlier, the point at which an effect is determined to be adverse may depend on any one of the three factors discussed above—whichever requires the more conservative limit on an effect of fishing. Once the point at which an effect becomes adverse has been determined, there are different ways in which it can be applied.

For some species and habitats—especially those for which determination of an adverse effect is based on biological limits—it may be appropriate to take strong measures to constrain any effects beyond what is adverse. Examples include threatened species (in which case the fishery may be closed when a by-catch limit is reached), or a particular habitat (for which regulatory closures may be imposed if other mechanisms are insufficient to protect the required amount of the habitat).

For other species and habitats—especially those for which determination of an adverse effect is based on a trade-off between current use and protection—it may be appropriate to use incentives and disincentives rather than fishery closures. For example, as discussed earlier, the point at which mortality of common dolphins in fishing operations is adverse is any level greater than zero. However, fisheries are not closed after one common dolphin dies in a fishing operation. Instead, fishers are expected to take all reasonable steps to avoid incidental common dolphin mortality in their fishing operations. A number of different tools could be used to provide incentives for fishers to minimise effects of fishing of this nature. These include codes of practice, financial penalties, and individual by-catch limits. Using tools like these, the trade-off between current use and protection can be reflected in the strength of the incentives imposed on fishers to minimise effects beyond the point at which the effect is determined to be adverse.

Maximising Flexibility

Consistent with the approach set out in the *Ministry of Fisheries Statement of Intent 2005–2008*, environmental standards should be designed so as to provide stakeholders with as much flexibility as practicable in achieving the standards.

For some species, setting standards in the form of output controls (e.g., maximum allowable bycatch level) should provide the greatest flexibility and be the most cost-effective means of achieving desired outcomes. Stakeholders can choose to operate the fishery within the output control in a variety of ways including:

- Competitive by-catch limits
- Individual by-catch limits
- Input controls
- Economic incentives

A good example of this approach is the New Zealand Sealion bycatch limit in the Squid 6T fishery around the Auckland Islands. The Ministry of Fisheries sets an annual limit, and there is potential for flexibility in how fishers achieve this standard. Already, fishers have undertaken experimental work on marine mammal excluder devices. Additional possibilities that stakeholders could utilise include withdrawing from the fishery vessels with a high sealion strike rate, individual (company or vessel) bycatch limits, and avoiding fishing in high-risk areas.

Typically, standards based on output controls will be most cost-effective for species for which the information costs are low. For species or habitats for which information costs are high, the cost of implementing output controls may also be high. For example, some seafloor habitats comprise many species about which little is known—even to the point that some species have not been named. Furthermore, because the major effect of fishing may be caused by the crushing or smothering effect of a trawl net and not be evident from what is caught in the trawl, it may be difficult and expensive to obtain accurate information on the effects of fishing on these species. Management of these species by output controls would require sufficient information to know that the effects of fishing are low enough to ensure long-term viability or other minimum standards. Obtaining this information for a large number of non-target species would be very expensive.

For these species and habitats, it may be more cost-effective to set standards using some form of input control. For instance, the Government might 'deem' that protecting a specified amount of a habitat type from the effects of fishing will achieve the desired outcomes in respect of that habitat type and all the species within it. Alternatively, it may be agreed that using only certain types of low-impact fishing methods will achieve the relevant standards. In each of these examples, standards could be designed to provide for the agreed approach. In each of the examples, information costs would be low, but this saving would need to be assessed against potential losses from the possible lower overall harvest of target species.

An example of this approach is the regulatory seamount closures. It would be very expensive to undertake the research necessary to demonstrate that the effects of fishing on every species occurring on seamounts are within acceptable limits. Closing a number of representative seamounts to fishing protects all species on those seamounts from the effects of fishing. The information costs in the latter approach are relatively low. Over time, the required level of habitat protection may be modified as more information on seamount habitat becomes available.

There is also potential flexibility for how fishers meet area-related standard including:

- Developing alternatives to regulatory area closures such as verifiable voluntary agreements.
- Developing fishing methods that do not affect habitats.
- Demonstrating that a fishing method affects only part of a habitat, thereby reducing the amount of that habitat requiring complete closure to fishing.

This Strategy is designed to provide a framework within which the effects of fishing on the aquatic environment can be managed efficiently. This means that, where practicable, stakeholders should be able to choose their preferred approach to managing 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.

4.0 Strategy Implementation Plan

Implementation of this Strategy will require significant changes to current practices. A key requirement will be the development of a suite of standards sufficiently comprehensive to set limits on all species and aquatic habitats where there is a risk of adverse effects of fishing. The key steps necessary to implement the Strategy are identified below.

4.1 Standard Setting

- i. Identify and regularly update international environmental obligations relevant to fisheries
- ii. Develop risk assessment methodology to assess risks of adverse effects of fishing
- iii. Develop suitable methods for obtaining information on social values and future values.
- iv. Develop suitable methods for undertaking trade-offs between social values, current use values, and future use values.
- v. Establish protocols for the application of the information principles to the determination of the biological limit component of environmental standards.
- vi. Prioritise species and habitats for development of environmental standards.
- vii. Develop environmental standards, starting with high risk species and habitats

4.2 Management to Achieve Standards

- i. Determine the minimum requirements for environmental impact assessments to assess risks of adverse effects of fishing.
- ii. Determine protocols for allocating environmental standards to specific fisheries.
- iii. Determine protocols for coordinating fishing practices in different fisheries to meet environmental standards.

4.3 Information; Input and Consultation; Coordination of Linkages

- i. Establish systems and processes to provide for tangata whenua and stakeholder input to standard setting.
- ii. Establish and maintain links with relevant research and management organisations (governmental & non-governmental).
- iv. Develop systems to obtain necessary information on the threat status of species and habitats.

4.4 Monitoring & Reporting

- i. Identify and monitor appropriate indicators of the strategy implementation
- ii. Identify and monitor appropriate indicators of desired fisheries outcomes.
- iii. Develop communication strategy.