



**Learning from New Zealand's  
30 Years of Experience  
Managing Fisheries under  
a Quota Management System**

The Nature  
Conservancy



**Editors**

Lynne Zeitlin Hale and Jeremy Rude, The Nature Conservancy

**Contributing Authors**

Michael Arbuckle, Independent Fisheries Consultant, New Zealand

Raewyn Peart, Policy Director, Environmental Defence Society, New Zealand

Lynne Zeitlin Hale, The Nature Conservancy

Jeremy Rude, The Nature Conservancy

Kate Kauer, The Nature Conservancy

Michael Looker, The Nature Conservancy

Carmen Revenga, The Nature Conservancy

**Design and Layout**

Arnaud Ghelfi, Atelier Starno

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*Cover Photography:  
Blue maomao round a  
lush bed of kelp in Poor  
Knights reserve.*

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—Lynne Hale and Jeremy Rude, Editors  
*The Nature Conservancy*

# Preface

The Nature Conservancy ([www.nature.org](http://www.nature.org)) works around the world to conserve the lands and waters on which all life depends. We have been protecting important natural places for over 65 years and have steadily expanded the scale and scope of our work. One of the world's largest conservation organizations and a leader in coastal and marine conservation, The Nature Conservancy brings together people of differing views to find and apply science-based solutions that work locally and globally. We engage in conservation in 69 countries and all 50 U.S. states.

For TNC, sustainable fisheries mean secure livelihoods, stable seafood supplies, strong coastal communities, and a healthy ocean. Our fisheries work is based on a proven track record of collaborating with fishers and the fishing industry to use science, technology, and policy to achieve tangible outcomes. We believe that by engaging with fishers, seafood companies, communities, and policymakers we can ensure that fishers and the seafood industry do not have to choose between making a living today and ensuring that their livelihoods last far into the future. Together, we protect and restore fisheries and fish habitats while making sure that [\*fishing remains a sustainable business\*](#).

In 2016, TNC launched a new country programme in New Zealand. Adopting a partner approach, we aspire to bring experience, tools, and capacity to support the greater vision for conservation in New Zealand. Our focus here is on marine and



Fishing vessels in the Whitanga Harbour

© Raewyn Peart

freshwater issues, emphasizing innovative, often market-based solutions that can advance conservation and sustainable use. In addition, this programme seeks to learn from New Zealand's long experience and many achievements in conservation and resource management in order to aid conservation in other places facing similar issues. Given TNC's engagement in fisheries management around the world, it is keen to learn and share insights from New Zealand's 30 years of experience in managing their fisheries through a rights-based approach.

This report attempts to document New Zealand's approach to fisheries management and how that approach has evolved over time. We have striven to provide a technically robust, balanced review by separating facts from perspectives and by reflecting the diversity of perspectives that exist. It is our sincere hope that this work is both a contribution to New Zealand and a resource for other nations and groups working towards the common objective of putting fisheries on the path to sustainability.

—Dr. Michael Looker, New Zealand Country Director  
The Nature Conservancy  
November 2017

# Guide to Using this Report

The Report is designed to enable readers to rapidly access key insights and lessons from the New Zealand fisheries management experience as well as to present a much fuller account of the history and current operation of New Zealand's Quota Management System (QMS). Overall insights and lessons learned from the New Zealand experience are summarized in Section 1. Our hope is that by providing this first overview of lessons learned, the reader can be guided to specific and in-depth coverage of each area related to the QMS. Each summative lesson references a subsequent section of the report that provides more complete and detailed information. A summary of each section of the report is found below. We hope that this format facilitates navigation through the document and allows readers to hone in on those areas that are of most interest to them.



*Fisherman holds a very large snapper*

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Chameleonseye

## Summary of the Report's Major Sections

### **SECTION 1: Insights and Lessons from the New Zealand Fisheries Management Experience**

This section draws out insights into and lessons from the New Zealand experience that we believe will be of interest to overseas audiences. For each lesson, we provide a small amount of context and refer readers to parts of the report where they can find more substantial information on the topic.

### **SECTION 2: The New Zealand Quota Management System**

This section provides a comprehensive overview of how New Zealand manages its fisheries under the QMS and how the system has evolved over its 30-year history. It is divided into 4 sub-sections as follows:

**2A: The Context for the Introduction of the Quota Management System into New Zealand** describes the status of fisheries and the major fishing sectors (inshore and deepwater) prior to the

introduction of the QMS along with the political context that existed in New Zealand when the QMS was first introduced in 1986.

### **2B: Key Components of the Quota**

**Management System** defines the core components of New Zealand's QMS (the Individual Transferable Quota (ITQ), Annual Catch Entitlement (ACE), Total Allowable Catch (TAC), and Total Allowable Commercial Catch (TACC)). It then describes how these and other key components of the system are determined and how they have evolved over time. The objectives that the QMS are meant to achieve and the nature and strength of the quota right are described. We describe how initial allocations for quota were made and how quota ownership has evolved over time, how TACs

and TACCs are set, and how research is prioritised and used within these processes. The section concludes with a description of how allocations are made in shared fisheries (fisheries that have both commercial and substantial recreational and customary harvests).

### **2C: Fishing Under the Quota**

**Management System** describes what a fisher needs to be able to fish each year (a permit and ACE) and how the system is designed to address harvests of non-targeted and non-QMS species through catch recording and balancing systems. The challenging issue of discards is discussed along with a description of the QMS's monitoring and compliance programs. The New Zealand government's new initiative to launch a mandatory Integrated Electronic Reporting and

Monitoring system aimed at obtaining better information for better management systems and increasing confidence in compliance and enforcement is then described.

### **2D: Funding Fisheries Management**

describes the components (Management, Information, Operational Advice, and Services, including research and policy) and cost of implementing the QMS. New Zealand's unique approach to funding a large proportion of these costs through a comprehensive system of direct taxation (called cost recovery) is then described. Other services funded directly by industry, including services devolved from government, and additional research activities are then described.



Cape Reinga  
seascape

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### SECTION 3: The Role of the Quota Management System in the Settlement of Māori Treaty Rights

This section describes the long journey of the Māori to have their rights to New Zealand's fisheries recognized through a settlement reached with the New Zealand government in 1992. The settlement resulted in a significant transfer of fishing assets (both quota and cash) to the Māori. This section describes the events that led up to the settlement, the settlement itself, and the settlement's profound impact on Māori institutions, on New Zealand's fishing industry, on the strength and nature of the QMS, and on ocean management overall.

### SECTION 4: The Principle Institutions Engaged in Fisheries Management in New Zealand

This section describes the organization and roles of key government agencies and the fishing industry itself in the management of the QMS. It also describes the organization and engagement of key stakeholders, notably recreational fishers and environmental groups, in the QMS and fisheries issues overall. The section concludes with a description of how these sectors interact.

### SECTION 5: Fisheries Management within the Wider Context of Ocean Conservation and Management

This section introduces the legal regime within which fisheries management



Grey mullet

© Josh Griggs

nects. It summarizes spatial conflicts that exist between fisheries and other uses of New Zealand's marine estate and the mechanisms—where they exist—that have been developed for coordination and conflict mitigation.

### SECTION 6: Outcomes Delivered by the Quota Management System

This section summarizes documented outcomes—biological, environmental, economic, and social—that have resulted from New Zealand's fisheries management approach. The section is divided into:

#### 6A: Biological and Environmental Performance

summarizes existing information on the current status of stocks managed under the QMS and presents available information about the environmental and ecosystem impacts

of fishing, including by-catch of fish, invertebrates, and protected species as well as impacts on the seafloor and food webs. The importance of healthy marine habitat for fish production is also highlighted.

**6B: Economic and Social Impacts** summarizes the contribution of commercial fishing to employment and exports in New Zealand, as well as the capital value of quota. Economic information on the recreational fishing sector is also presented, as are findings from a number of studies on impacts that the QMS has had on coastal communities, recreational fishers, and the Māori. The section concludes with a look at how the commercial fishing industry and fisheries management in New Zealand is perceived by the nation's citizens and how the industry seeks to improve these perceptions.

# Table of Contents



*Kelp on the Kaikōura coast*

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<b>INTRODUCTION</b> .....	9
<b>SECTION 1: Insights and Lessons from the New Zealand Experience</b> .....	16
<b>SECTION 2: The New Zealand Quota Management System</b> .....	29
Section 2a: The Context for the Introduction of the Quota Management System into New Zealand .....	30
Section 2b: Key Components of the Quota Management System .....	37
Section 2c: Fishing Under the Quota Management System .....	49
Section 2d: Funding Fisheries Management .....	54
<b>SECTION 3: The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights</b> .....	58
<b>SECTION 4: The Principle Institutions Engaged in Fisheries Management in New Zealand</b> .....	71
<b>SECTION 5: Fisheries Management within the Wider Context of Ocean Conservation and Management</b> .....	84
<b>SECTION 6: Outcomes Achieved Under the New Zealand Quota Management System</b> .....	100
Section 6a: Biological and Environmental Performance .....	101
Section 6b: Economic Performance and Social Impacts from the Quota Management System .....	115
References .....	129

# Introduction



# Introduction



Wild capture fisheries provide a vital source of income and food for millions of people and can significantly affect the health and resilience of ocean ecosystems. Putting global fisheries on a path to sustainability is a widely shared goal among nations and an essential element of the United Nations' Sustainable Development Goal (SDG) 14.

Achieving the SDG 2020 fisheries targets is an enormous challenge. The World Bank estimates economic losses resulting from inadequate management of marine fisheries to be greater than \$80 billion USD per year (World Bank, 2017). Globally, the number of fish stocks harvested at unsustainable levels has continued to increase, with over 30% of assessed stocks overfished and many more remaining unevaluated because of a lack of data (United Nations Food and Agriculture Organization [FAO], 2016). However, there are also multiple countries and fisheries where declines have been reversed and recovery is underway (Worm et al., 2009). The basic tenets of what it takes to achieve sustainable fisheries are well known: only take as many fish as can be replaced and maintain the environment that is essential for producing fish. The challenge

is developing and implementing practical, effective, and widely supported management strategies for a common-pool resource that fits within the socio-political context of a place.

According to the UN Food and Agriculture Organization (FAO), the general goal of fisheries management is to achieve sustained optimal benefits from the resource without jeopardizing benefits to future generations (FAO, 2016). Fisheries management is then defined as “the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources, and formulation and implementation,

## SDG Target 14.4

By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics (<https://sustainabledevelopment.un.org/sdg14>).

with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives" (Cochrane & Garcia, 2002). The FAO Code of Conduct (FAO, 2011), which has widespread

international acceptance, also stresses that fisheries management should be conducted within an ecosystem approach that requires balancing diverse objectives, recognizing knowledge gaps and uncertainties, and convening all stakeholders involved in evaluating the entire fishery and the ecosystem.

Harataonga Beach,  
Great Barrier Island

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As nations and fisheries managers work to improve underperforming fisheries and sustain a healthy marine environment, understanding the fisheries management approaches that other nations have used, the contexts in which they have been used, and the results they have yielded can help inform policy changes. Multiple international studies that have compared the performance of different fisheries and management systems have rated New Zealand relatively highly when compared to other countries (Branch, 2009; Chu, 2009; Costello et al., 2016; Grainger & Costello, 2014; Hilborn, 2003; Hilborn et al., 2005a; Hilborn & Ovando, 2014; Melnychuk et al., 2016; Mora et al., 2012; Worm et al., 2009). However, the findings in some of these comparative papers regarding New Zealand's performance have been the subject of substantial debate (Melnychuk et al., 2017b; Slooten et al., 2017), and there is a body of local literature that is more critical of the system than the international assessments would indicate (Bess, 2012; Mace et al., 2014; McKoy, 2006; Torkington, 2016; Winder, 2017). Despite the different perspectives on the performance of New Zealand's fisheries management system, New Zealand's experience in fisheries management offers lessons relevant to many other countries that are contemplating fishery reform efforts.

New Zealand manages most of its commercial fisheries through a Quota Management System (QMS), a specific type of rights-based fisheries management system. However, New Zealand's QMS consists of many elements in addition to the allocation and trading of rights, providing the overall framework for the management of commercial fisheries in New Zealand. Other management regimes are used for New Zealand's recreational and customary fishery harvests. Although the use of a rights-based fisheries management system is not unique to New Zealand, no other country has

developed and used a system as comprehensive or as widely implemented as New Zealand's for as long a period.

Rights-based fisheries management can take many forms and has existed in some form for centuries (Cochrane & Garcia, 2002; Grafton et al., 2006). Rights-based fisheries management allocates harvest rights to individuals, companies, collectives, or cooperatives, or can take the form of territorial use rights (TURFs) (Grafton et al., 2006; Huppert, 2005). Use rights vary in their implementation. These systems—and the principles that underpin them—are based on the belief that when rights are secure, have long-term duration, and are transferable, rights holders have a greater incentive to invest in the management of the resource and will take actions to ensure its sustainability to maximize their own benefits over time. The investment of rights holders improves economic efficiencies and the stewardship of the resource (Scott, 1988; Wilen, 2005). They are also based on the proposition that secure, long-term harvesting rights can create incentives for collective action, where such rights are held in common amongst rights holders, to implement management services such as monitoring, scientific research, and enforcement, which can maintain and increase the value of their rights (Grafton et al., 2006; Scott, 1993). In addition, use rights can provide a basis for distributing or allocating joint management costs across rights holders, thereby removing barriers to collective action or cooperative management (Scott, 1993). Multiple researchers have highlighted the potential drawbacks or downsides to rights-based fishery management approaches, including the potentially high costs of monitoring and enforcement, the consolidation of ownership of access rights, changes in the distribution and flow of economic benefits—particularly to fishing communities—, inequitable initial allocation methods, and the uncertain ecological effects on non-target species, marine habitats, and broader ecosystems (Branch, 2009; Copes & Charles, 2004; Hilborn et al., 2005b; NRC, 1999; Sumaila, 2010; Winder, 2017).

## Report Purpose and Approach

The objective of this report is to document New Zealand's experience in managing its fisheries under a Quota Management System over the last 30 years and enable others to access and learn from it. We strive to present an objective description of the New Zealand fisheries management system and the results and impacts the QMS has yielded—for the resource and for the people engaged in the fishing industry, as well as for the broader marine environment and diverse groups of New Zealanders who use and value the ocean and its fisheries.

To identify the aspects of New Zealand's experience that would be of greatest interest to overseas readers interested in understanding more about rights-based fisheries management, we

### Quota-Based Fisheries Management Systems

In 2013, nearly 200 rights-based management programmes existed across 40 countries (Bonzon et al., 2010). Quota-based systems, like the one used in New Zealand, are a type of rights-based management in which a secure and exclusive portion of the annual catch limit, or Total Allowable Catch (TAC), is apportioned to fishery participants. Quota owners are afforded the right to harvest an amount of the TAC each year (in the case of New Zealand this is called an Annual Catch Entitlement (ACE)). Quota-based programmes can allocate quota to individuals, groups, companies, or communities and can be geographically bounded. Quota rights can be transferable, as is the case in New Zealand, and can be referred to as Individual Transferable Quota (ITQ) programs (Bonzon et al., 2010; Branch, 2009). Individual quota programs that do not allow for transferability of the use rights are referred to as Individual Quota (IQ) programs; programs that allocate use rights to vessels rather than persons are referred to as Individual Vessel Quotas (IVQ); and individual bycatch quotas (IBQs) are also sometimes incorporated into management regimes (NRC, 1999). While all quota programmes share some characteristics, every government that implements a quota programme may impose its own unique limitations on trades, duration, and use of quota shares, including caps on ownership of shares, restrictions on ownership by foreign fleets, and gear restrictions (Grainger & Costello, 2014).

conducted more than 30 interviews in six countries: Peru, Chile, U.S., Mexico, Belize, and Indonesia. These countries encompass huge variation both in governance and in the penetration and maturity of rights-based fisheries management approaches within their fisheries (Aranda, 2009; Bernal et al., 1999; Castaneda et al., 2011; De Alessi, 2014; Hernandez & Kempton, 2003; McCay et al., 1995). In addition, the motivation for pursuing rights-based systems in these countries and the challenges faced in implementing such systems differs widely, which generated diverse inquiries regarding New Zealand's QMS. Ultimately, the goal of the interviews was to help focus our report on topics that are of most interest to our target audience and to draw out implications that are relevant to multiple stakeholders. In each country, we interviewed representatives across a range of sectors that included government (10), academia (6), industry (7), and non-governmental organisations (10). The primary topics of interest from respondents included:

- Impetus and enabling conditions for creating the QMS: motivation and generation of political will.
- Design of the QMS: decision-making processes for quota allocations, the role of science in supporting the system, cost and funding sources, methods of monitoring and enforcement, and stakeholder roles and responsibilities.
- Implementation of the QMS: co-management arrangements, accountability, compliance, conflict resolution, and communication with stakeholders.
- Outcomes and impacts of the QMS: socioeconomic impacts, how the quota market evolved over time, implications for indigenous rights, changes in stock health, and the interface between fisheries and the environment.

The information presented in the report is drawn from published and "grey" literature, government and industry reports and databases, and interviews with individuals across the many sectors that have an interest in New Zealand's fisheries, including representatives from government, the commercial and recreational fishing sectors, iwi (a Māori tribe; the largest of the groups that form Māori society), and environmental



*Fishing vessel  
hauling in catch*

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non-governmental organisations (ENGOS). We strove to separate factual information from the multiple perspectives that exist about the same set of facts. And while there is a wealth of information about New Zealand's fisheries management to draw from, there are also real gaps in information. For example, we could find little information on pre-QMS environmental impacts and, even today, there is limited information on many environmental impacts, including the cumulative impacts of fishing on marine ecosystems. Similarly, there is limited information on economic and social benefits and their distribution

**We do not envisage that New Zealand's QMS will be replicated. Rather, we hope that readers are prompted to think in new ways about how to advance fisheries management in their own countries using ideas and lessons from New Zealand's experience.**

derived from improved economic performance. Historical data sets on catch and quota trades over time, particularly prior to the establishment of FishServe in 2001, are difficult to source and few studies have analysed the data that are available.

It is our intention that the information and insights provided in this report on the operation of the QMS and its relationship to the wider management of the marine environment informs the future development of fishery management programs outside New Zealand.

We recognize that every country is unique, and each must invent the fisheries management system that can work within its own political, social, and ecological context. We do not envisage that New Zealand's QMS will be replicated.

Rather, we hope that readers are prompted to think in new ways about how to advance fisheries management in their own countries using ideas and lessons from New Zealand's experience.

## New Zealand and Its Fisheries

As of March 2017, New Zealand has a population of 4.79 million and a GDP of around \$264 billion NZD. New Zealand's exclusive economic zone and territorial sea is the fourth largest in the world (4,300,000 km<sup>2</sup>), and New Zealand's coastline (15,000 km) is the ninth longest in the world (Figure 1). The country is a constitutional monarchy, governed by a parliamentary democracy, and experiences very low levels of corruption in government (Transparency International, 2017).

New Zealand's commercial fisheries play an important role in the country's economy, contributing 0.7% of the New Zealand GDP and making up a significant portion of the

**FIGURE 1.** New Zealand's exclusive economic zone and the ten Quota Management Areas



economy in some parts of the country (Williams et al., 2017). Approximately 450,000 mt of wild fish are harvested each year and most of the catch is exported. Wild fish exports ranged from \$1.2 to \$1.5 billion NZD per annum over the last 5 years, accounting for about 3% of the total value of New Zealand's exports and ranking 4th behind dairy (25%), meat (15%), and forestry (6%) (Williams et al., 2017). The most valuable fisheries include inshore finfish (snapper and blue cod are most important), shellfish (lobster and paua (abalone) are most important), and deepwater fisheries (hoki, ling, and squid are most important). Commercial fishing directly employs 4,394 full-time equivalents (FTEs), with a total sector employment of 13,730 FTEs. This is equivalent to 0.7% of New Zealand's total employment (Williams et al., 2017). In addition, it is estimated that recreational fishers spend \$946 million NZD each year on marine fishing, which circulates through the national economy supporting 8,100 jobs and stimulating \$1.68 billion NZD in total economic activity (Holdsworth et al., 2016).

In 2016, there were 1,178 commercial fishing vessels registered in New Zealand and 239 licensed fish receivers and processors. In 2014—the latest year data are available—there were 309 enterprises engaged in the Fish Trawling, Seining, and Netting industry, 348 in the Line Fishing industry, 366 in Other Fishing enterprises, and 246 in the Rock Lobster and Crab Potting industry. In 2014, there were 132 business units in the Seafood Processing industry. While some 2,200 individuals and companies now own quota as part of the QMS, with the quota estimated to be worth \$3.5 billion NZD, a relatively small number of companies (8) own large amounts of quota (Williams et al., 2017).

Fisheries management in New Zealand has evolved greatly over the years and the current QMS system bears little resemblance to its initial design in 1986. Today, New Zealand's QMS is a complex amalgamation of systems and processes born out of 30 years of practice, application, and adjustment, with *multiple additional adjustments currently under consideration.*



Seafood processing  
facility

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## SECTION 1

A wide-angle photograph of Wharariki Beach in New Zealand. The scene features a large, dark, craggy rock formation with a natural sea stack and a natural rock archway. The rock is partially covered in green moss or algae. The ocean is a deep blue with white-capped waves breaking against the shore. The sky is a clear, pale blue. The foreground shows a wide, sandy beach that is wet, creating a clear reflection of the rock formation and the sky in the shallow water.

# Insights and Lessons from the New Zealand Experience

Wharariki Beach

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Romanonillonphotography

## SECTION 1

# Insights and Lessons from the New Zealand Experience



Here we summarize what we believe to be some of the important insights and lessons from New Zealand's experience managing fisheries under a QMS. The lessons are framed around the broad topics and questions identified during our interviews. Each lesson or insight below provides a reference to the section of the report where more comprehensive and detailed information about that topic is included and discussed.

## Quota Management System Introduction

■ **A quota system can be introduced to improve poor economic conditions (e.g. overcapitalization within a fishery), attract investment capital to fisheries, and/or address overfishing.** New Zealand initially allocated individual quotas in offshore fisheries to provide greater security for domestic investments and enable economic development, thereby leading to the “New Zealandisation” of mid and

deepwater fisheries within the exclusive economic zone (EEZ). Conversely, in inshore fisheries, the motivation for allocating transferable quota was to address the overcapitalization of the fleet and overfished stocks after other management controls had failed. ([Section 2a](#))

■ **Gaining acceptance for a new approach to fisheries management requires a clearly articulated and timely policy agenda as well as significant industry and government support to move forward.** In New Zealand, two documents, the 1983 Green Book (which documented the declining state of inshore stocks, the economic overinvestment in fishing capacity, and the need for urgent action) and the 1984 Blue Book (which proposed a system of management founded on the allocation of Individual Transferable Quota for all major commercial fisheries in New Zealand), catalysed the opportunity for change and were critical in framing the dialogue around the development of a Quota Management System. These documents were released in a

social and political context in which New Zealand was shifting from a centralized government-management approach to a more market-based economy. The combination created interest and receptivity within government and industry for a different approach to fisheries management. ([Section 2a](#))

- **The broader governmental, economic, and fisheries context as well as previous incremental fisheries management measures matter for how the introduction of a Quota Management System will be received by stakeholders.** Before the QMS was introduced in 1986, New Zealand already had some experience with fisheries management measures that limited fishing capacity and increased security of access. Concerns about overcapacity and overexploitation of inshore fisheries led to several efforts to limit the number of commercial fishers, including a moratorium on new entrants in 1982 and the cancellation of permits for part-time fishers in 1983. Leading up to the introduction of the QMS, the New Zealand government allocated fishing rights in the EEZ to encourage domestic companies to expand into deepwater fisheries. By first introducing management measures meant to address overcapacity and overexploitation, and subsequently using individual quotas

Line, hook, and sinker

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as a tool to regulate foreign-take and encourage domestic fishing in deepwater fisheries, New Zealand was primed to extend the QMS to inshore fisheries. Additional pre-QMS events had important and ongoing implications for its initial acceptance and future operation. ([Section 2a](#))

## The Quota Management System's Design

- **A Quota Management System's design should accommodate system evolution over time; hence, processes and timescales for system review and evolution need to be considered.** Implementation of the New Zealand QMS has evolved considerably over its 30-year history, with almost every aspect of the system experiencing some change. Currently in New Zealand, there continues to be robust discussions about the further evolution of the QMS through both Government-sponsored processes and a range of stakeholder initiatives. However, because the QMS was established from the onset as a system of rights issued in perpetuity and later became a system that was used to recognize the rights of New Zealand's indigenous people, its fundamentals are not the subject of regular review. (Sections [2b](#), [3](#))
- **Clear management objectives need to be set to guide the design and implementation of a Quota Management System.** The Fisheries Act 1996, passed ten years after the QMS was introduced, was the first New Zealand fisheries statute to contain an explicit purpose for governing the management of QMS fisheries: *"to provide for utilisation of fisheries resources while ensuring sustainability."* This was an important addition to the existing QMS, yet subsequent efforts to make its purpose operational through specific policies have not been realized in New Zealand. In addition, because objectives tend to incorporate societal values, and these may change over time, explicit consideration of whether and how programme objectives can evolve is an important consideration of the system design. (Sections [2b](#), [5](#))

■ **How many and which species are included in a Quota Management System has significant implications for all aspects of fisheries management.** When the New Zealand QMS was first introduced, only 26 economically important species (153 stocks) were included. By 2017, the QMS included 98 species or species groups (642 stocks), including 292 stocks which were commercially undeveloped. These stocks were introduced into the QMS with very low catch levels to stop their uncontrolled development. The large number and substantial variation of commercial importance among QMS stocks has implications for overall management costs, the amount of research required, cost recovery, monitoring, and how by-catch and catch balancing is handled. (Sections [2b](#), [c](#), [d](#))

■ **Establishing geographically large Quota Management Areas (QMAs), while simpler to administer, can complicate the management of multiple stocks.** In New Zealand, quota rights are geographically bounded in QMAs. The overlap between QMA and the geographic distribution of fish stocks does not often coincide, and in many cases management is further confounded because the biological distribution of stocks is not known. While there are mechanisms that enable adjustments to New Zealand QMAs, they are not easily applied as they require re-specification of the ITQ right. In designating QMAs, managers must balance the need for administrative efficiency with the geographic integrity of the stock to be managed, and they must have mechanisms for adjusting boundaries when needed. ([Section 2a](#))

■ **Processes are needed for dialogue and joint problem solving when there are multiple fishing sectors (e.g. commercial, recreational, and customary) managed under different systems.** In New Zealand, commercial, recreational, and customary fisheries are each managed under different systems and there are limited processes in place that enable dialogue, collective problem solving, and voluntary trade-offs between sectors. This has resulted in conflicts over multiple aspects of fisheries management, including where



Fishing vessels in the Nelson Harbour

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stock biomass targets should be set, how allocations are made in shared fisheries, and solutions to localized depletion. ([Section 2b](#))

■ **A strong quota right can result in a relatively high economic value for quota and a range of other benefits. It can also create a contentious interface between quota holders and other users of marine space and resources.** In New Zealand, the quota right is considered strong (based on its exclusivity, duration, flexibility, quality of title, transferability, divisibility, and incorporation into the government's treaty settlement with the Māori) and has high value. It has therefore been important in New Zealand that impacts on quota rights from proposed and actual uses of the marine space (e.g. marine reserves, marine farming, and sea-bed mining) be explicitly addressed. Government actions that are perceived to weaken the right (e.g. increased harvest allocations to other sectors, some spatial restrictions, and/or the declaration of marine reserves) have sometimes been the subject of court challenges. (Sections [2b](#), [3](#), [5](#))

■ **The basis for initial quota allocations (i.e. proportional vs. fixed tonnage) has significant implications for which entity (government or quota owner) absorbs costs and benefits when fish stock size changes.** In New Zealand, initial allocations of quota were made as a fixed tonnage of a stock. This meant that Government directly absorbed the benefits (through auctions of quota for new or expanded stocks) and costs (catch reductions were implemented via Government buyback schemes funded through central taxation). The introduction of proportional quota in 1990 moved the risks of changing stock sizes and total allowable catches to quota holders, as the Government is now able to implement stock rebuilding and reallocation decisions without bearing the financial responsibility for reductions in allocated fish to quota holders. ([Section 2b](#))

■ **The integrity and acceptability of newly introduced quota systems depends, in part, on clear objectives and allocation criteria that are perceived as fair and can be supported by accurate and transparent records.** In New Zealand, the approaches taken for initial quota allocation in inshore and deepwater fisheries were different. Inshore quota was allocated based on catch history recorded for a three-year period prior to the introduction of the QMS and an appeal process was implemented whereby fishers could initiate a review of their allocation. Because part-time fishers were excluded from commercial fishing in 1983 they did not receive quota and therefore received no compensatory financial benefit when leaving the industry (whereas full-time fishers received an asset which they could realise on retirement). For deepwater fisheries, there was little controversy over quota allocations as they were made based on "Enterprise Quotas" that had been given to New Zealand companies fishing offshore beginning in 1983. With the introduction of the QMS, almost half of the deepwater quota was allocated to New Zealand's top 12 fishing companies with the remainder auctioned by Government. ([Section 2b](#))

■ **Under a Quota Management System, consolidation of quota will likely occur to the maximum extent allowed under the rules.** Instituting transferability will lead to quota trading and consolidation and may shift the distribution of costs and benefits. Currently, while some 2,200 individuals and companies now own quota as part of the QMS, eight companies own roughly 75% of quota and many harvesters own no quota. Although quota ownership may consolidate, it does not always result in benefits accruing to fewer people, although the beneficiaries differ. In New Zealand, iwi ownership of quota and publicly-held corporations have enabled certain benefits and value to be dispersed to large numbers of iwi members and stockholders whereas harvesters are receiving a much smaller portion of the overall value. (Section [2b](#), [6b](#))

A blue cod on the seafloor

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■ **Devising an efficient, cost effective catch-balancing system is essential to the operation of a Quota Management System.** When the QMS was first introduced in New Zealand, fishers were required to secure quota for all the fish they caught (both targeted and non-targeted) prior to fishing. This changed when the catch-balancing system was revised under the Fisheries Act 1996. Fishing under the current QMS requires that fishers have or are able to acquire sufficient Annual Catch Entitlements (ACE) to cover both their targeted catch as well as by-catch of other QMS species. Quota owners receive ACE annually. ACE can be traded and must be obtained to balance catches on a monthly basis, and then to balance catches fully at the end of the year. Fishers that do not balance ACE against catch pay a deemed value (which is essentially a fine based on the amount of fish caught without ACE) to the government. The changes to the catch-balancing system made obtaining ACE a critical aspect of commercial fishing in New Zealand. The current system places greater accountability on commercial fishers to report and balance their catch with ACE and allows for a greater number of stocks to be subject to control. A greater number of stocks, including those that were previously considered by-catch and went unrecorded, are subject to reporting obligations and must be recorded even if discarded. However, many harvesters in inshore finfish fisheries either do not own any quota or own insufficient amounts of quota to participate in the fishery and thus must obtain ACE, which can be costly or unavailable. (Section [2c](#), [6b](#))

■ **Additional fisheries rules are required to achieve the Quota Management System management objectives in addition to rights allocation.** A rights-based management system sits within a wider regulatory and legislative framework. In New Zealand there are many thousands of additional rules and regulations related to fisheries, including rules promulgated prior to the QMS system, rules under the Fisheries Act 1996, and rules established under other acts (e.g. the Wildlife Act and the Marine Mammal Protection Act) that affect commercial fishing. When a quota system



Commercial fishing vessel (Otakou) hauling hoki

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is introduced, a systematic review is needed to reconcile the new system with pre-existing fisheries regulations. It is also necessary to consider whether, and if so, how externalities—particularly environmental and social impacts—will be addressed.

## Science and Information

- **An effective Quota Management System requires setting a Total Allowable Catch (TAC) for each managed stock that is consistent with management objectives and long-term sustainable yield.** Most (but not all) QMS fisheries have a binding TAC. Where a TAC is set to manage harvest, such is the case for most QMS species in New Zealand,

A research vessel (the Amaltal Explorer) surveying for orange roughy

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accurate information on a range of parameters including stock biology, total harvest and other sources of mortality, and environmental conditions is required. As uncertainty increases, more precaution should be used in setting the TAC. New Zealand adopted a Harvest Strategy Standard in 2008 that it uses to set the annual TAC for commercially harvested species within the QMS. The level of scientific information available and frequency of stock assessment varies considerably; larger, more valuable stocks tend to receive greater attention. Since data on recreational harvest, which is substantial for some stocks, is not routinely collected, accurate information on total harvest is lacking in fisheries that have both recreational and commercial harvests. Finally, science that supports setting TAC tends to occur at a slower pace than environmental change, presenting constant challenges for managers and industry. Setting the TAC conservatively may allow more “head room” in the case of inadequate science or unanticipated environmental changes. ([Section 2b](#))

- **An effective Quota Management System requires accurate monitoring of targeted catch, by-catch, and discards both for quota accounting and accurate stock assessments.** Over the New Zealand QMS's 30-year history, both government and industry have made considerable investment in catch-monitoring and reporting systems, particularly in the deepwater fisheries. While substantial and essential information has been collected through existing systems which rely on self-reporting supplemented by limited observer coverage, there has also been considerable debate about the accuracy yielded by the current monitoring and accountability system. Recognizing the opportunity that new technology can provide, such as making it possible to collect higher quality data at lower cost, New Zealand is poised to require electronic monitoring and reporting technologies on all fishing vessels in both deepwater and inshore fisheries. These technologies are aimed at supporting better decision making and compliance. ([Section 2b](#))

■ **A result of limited budgets for science can be that the majority of science resources get directed towards high-value species.** Given the high number of species managed under the QMS, New Zealand does not have enough resources to carry out scientific research and assessments on all managed species. The processes used to develop research priorities have evolved over the years, with a risk-based approach underlying most of the priority-setting approaches. This approach has left some lower value stocks and associated topics underfunded and unaddressed. As a result, TACs can and have remained unchanged for many stocks over long periods. At the same time, for many of New Zealand's stocks where information is limited, low TACs are set as a result of the trade-off that has occurred between risk to the fisheries and the research cost. Globally, there are an increasing number of low-cost assessment methods being developed that could be useful to consider for setting TACs for low-value stocks. ([Section 2b](#))

■ **Maintaining and balancing the budget allocations for science that are essential for fisheries management and ocean health overall can be challenging, particularly where costs for scientific research are charged as a fishing cost.** In New Zealand, fisheries research relevant to management decisions and research on the marine environment more generally are carried out through projects funded through the QMS cost-recovery system, Fisheries Stakeholder Representative Entities (SRE), and multiple government ministries including the ministry responsible for managing fisheries. Science-related cost recovery funds in New Zealand are assessed on and largely used to support research on major fisheries. In addition, SREs that focus on these fisheries fund additional research on topics of particular importance to them. This system re-enforces an underlying QMS principle that fisheries management costs should be paid by quota holders. However, it has also led to concern among some New Zealand stakeholders from the academic and environmental communities that public funding for basic fisheries and marine-related research has diminished over time as a consequence of such policies. (Sections [2b](#), [2d](#))

## Implementation of the Quota Management System

■ **A Quota Management System can fundamentally change the roles of government and industry in fisheries management, requiring each to organize differently and take on different responsibilities.** In New Zealand under the QMS, Government sets fisheries policy, establishes maximum stock harvest levels through setting the TAC and TACC, delivers or contracts for research and other services essential to meeting management objectives, and is responsible for monitoring and compliance. After the introduction of the QMS, New Zealand's fishing industry became highly organized and, through a range of stakeholder representative entities and Commercial Fisheries Services Limited (FishServe)—a company wholly owned by the Fishing Industry—, now carries out multiple activities that are central to the operation of the QMS including activities that are contracted by the Ministry and others that are devolved. The latter services include contracted activities such as levying fees for cost recovery, issuing fishing permits, and catch balancing as well as devolved services associated with the management and operation of the quota and ACE registries. ([Section 4](#))

*Scientists working on the acoustic optical system, a high-precision monitoring method to 'snapshot' winter-spawning populations*

© Deepwater Group Ltd



■ **Engagement in a Quota Management System by environmental NGOs requires substantial resources and a perception that such engagement is important for achieving their objectives.** While New Zealand's Fisheries Act and the QMS call for engagement by all stakeholders, including environmental NGOs, meaningful engagement is resource intensive and requires significant scientific expertise. Few environmental NGOs have had sufficient dedicated resources to fully participate in the multiple processes that are part of the QMS. In New Zealand, ENGO engagement in QMS processes has diminished over time. Environmental NGOs, and in some cases groups of academics, have largely worked to influence fisheries management decisions through other strategies ranging from advocacy, to engaging in the MSC certification processes, developing consumer guides, working directly with seafood companies, and focusing on other pieces of marine legislation, policy, and action. ([Section 4](#))

■ **Total Allowable Catch targets should be set against explicit principals and through transparent processes. In shared fisheries, substantial conflict among sectors is likely if such processes are lacking.** New Zealand's experience of significant conflict with the numerous, economically important, and politically powerful recreational fishers is not unique. Setting management targets, TACs, and allocations (TACCs) for shared fisheries in New Zealand is highly contentious and politically charged. Clear principles, complete information on harvests by all sectors (currently there is not a system in place for the routine reporting of New Zealand's recreational catch), and inclusive, transparent processes related to stock rebuilding plans and how additional allowable catch resulting from rebuilt stocks will be allocated are not apparent, nor are there mechanisms that enable constructive inter-sectoral dialogue. ([Section 4](#), [6b](#))

■ **A Quota Management System can enable both a substantial cost recovery and a high level of self-funding from the industry.** Under the QMS, the New Zealand government was able to introduce a regime of direct taxation called "cost recovery." New Zealand is unique in that its cost recovery funds a large proportion of fisheries management costs, including funds used for research, monitoring, and enforcement. The cost recovery framework has also stimulated the industry to engage more in management in order to develop and implement systems that reduce costs and improve the value of services to support management decisions. Cost recovery funds in New Zealand, however, are not equally distributed nor sufficient to support science on all stocks. Stocks with greater economic value receive greater funding for research and monitoring. ([Section 2b](#), [2d](#))

■ **Devolution of fisheries from government to industry requires clear, transparent, and robust frameworks that provide appropriate checks and balances and which are perceived to protect the public interest.** In New Zealand, cost recovery has substantially augmented government capacity. It also stimulated quota owners to develop organisations and systems that effectively take on certain devolved

Leigh wharf and fishing fleet

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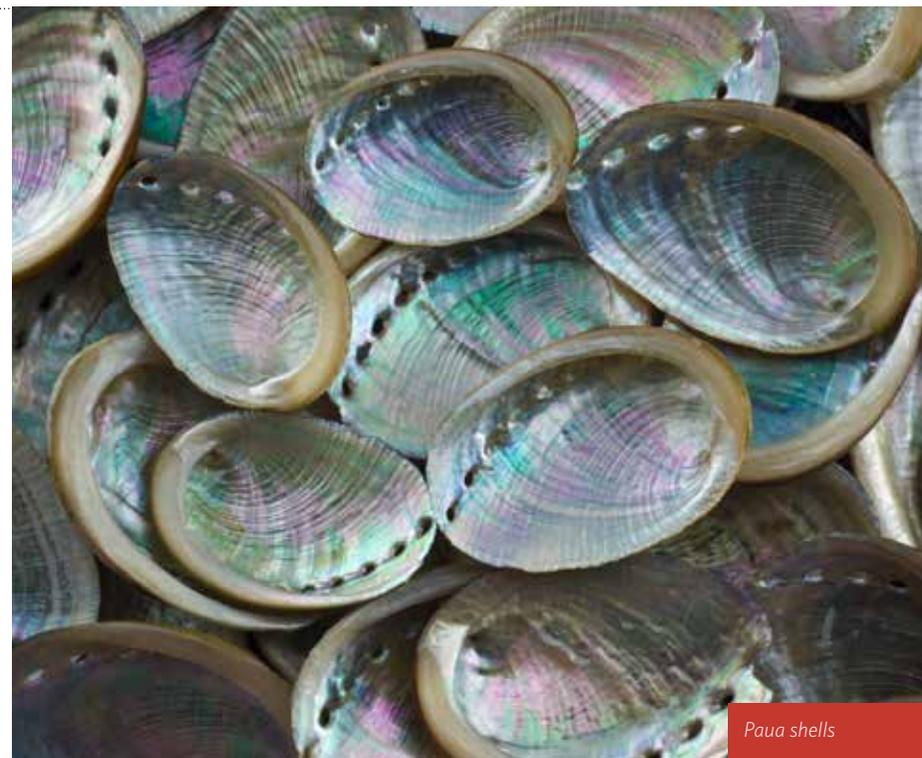
fisheries management responsibilities. There is debate in New Zealand about the adequacy of the checks and balances that New Zealand has put in place, and this has affected public perceptions about the relationship between government and industry. (Sections [4](#), [6b](#))

■ **Maintaining public support for a Quota Management System can present challenges for government and industry.**

In New Zealand, the public's perception regarding the status and management of fisheries does not necessarily accord with the positive reports on fisheries status from government or international assessments. There are multiple views as to why this is the case. Among the factors that different stakeholders identify are a lack of understanding about the QMS, its origins, and achieved outcomes; a lack of sufficient progress on topics of concern to the general public, such as localized depletion, environmental impacts, and wastage; the lack of processes that build relationships between sectors and that enable people to have meaningful input; and changing societal values and expectations about the marine environment. Both government and industry have efforts underway that they believe will contribute to addressing this issue. ([Section 6b](#))

■ **Effective two-way communication on new fisheries policies may reduce opposition, conflicts, and misunderstandings.**

This requires significant and skilled investment in meaningful outreach and engagement with those who will be affected by the changes. The New Zealand government has extensive formal and informal consultation processes for changes to the QMS system, including public notices, draft documents with substantial periods for public submissions, public meetings, and drop-in sessions. Stakeholder participation in such processes tends to be high. At the same time, some stakeholders find the processes inadequate, citing the need for more substantive background material, clearer descriptions of how policies are to be implemented, and a format that brings different sectors together and encourages two-way dialogue. (Section [2a](#), [6b](#))



*Paua shells*

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## Outcomes Delivered by the Quota Management System

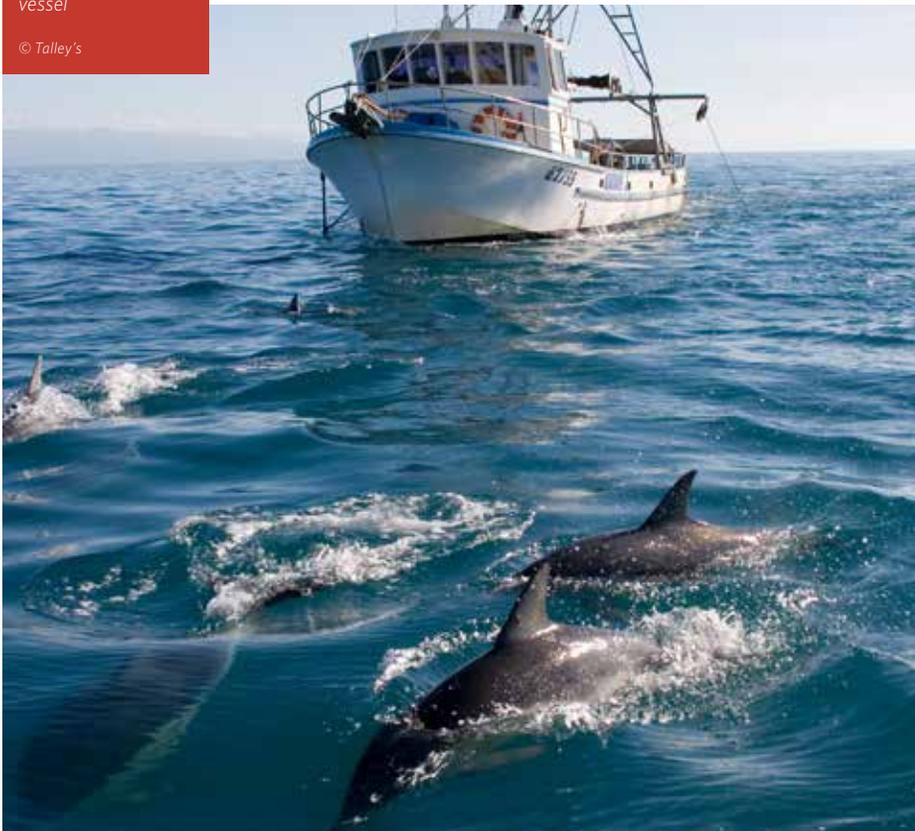
### Fish Stocks

■ **Quota Management Systems can deliver sustainable stock outcomes.** According to government data, the majority of New Zealand's stocks (particularly its high-value commercial species) are managed sustainably (defined as within target ranges) and six fisheries (all mid and deepwater) have received Marine Stewardship Council certification. Data-poor and low-value stocks receive less research and management attention, making it more challenging to draw conclusions about sustainability. In shared fisheries, achieving sustainability is challenging due to the lack of robust information and controls on the non-commercial sectors of the fishery. ([Section 6a](#))

- **A Quota Management System can provide, but does not necessarily always result in, a precautionary approach to fishery management.** There are tools within the New Zealand QMS, such as the ability to prohibit fishing for particular stocks, restrict permits, or set a low TAC when a new fishery is placed under quota management, that can and have been used to take a precautionary approach to fishery management and use. The latter, especially, has attracted criticism from both NGOs and industry. The industry sees it as a constraint on development, while environmental NGOs see it as an insufficient measure for stock protection. Multiple New Zealand ENGOs have argued that New Zealand's Fisheries Law needs to be further strengthened to require that a precautionary approach to management be used.

*Dolphins swimming in front of a fishing vessel*

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## Environmental Impacts

- **A Quota Management System, on its own, does not necessarily provide incentives to address the environmental impacts of fishing. These impacts can potentially be extensive and include by-catch, incidental take of protected species, impacts on the sea floor, and changes in food web dynamics with additional regulatory and non-regulatory approaches needed to mitigate these impacts.** Fishing under the QMS impacts other QMS species, non-QMS species, and the broader marine environment. Scientific research has documented many of these impacts—the government publishes an annual report summarising current knowledge on the interactions between harvesting and the aquatic environment highlighting specific topics and issues—but this information has yet to be explicitly incorporated into fisheries management decision making (including the setting of TACs). Regulations promulgated both under the New Zealand Fisheries Act and other legislation, as well as voluntary actions by industry, have worked to mitigate some impacts, but others remain unaddressed. There are insufficient data to assess the full ecological impacts of commercial fishing on New Zealand's coastal and open ocean ecosystems and a comprehensive assessment of the cumulative impacts of commercial fishing under the QMS on New Zealand's marine environment has not been done to date. ([Section 6a](#))
- **Since a Quota Management System operates within a larger ecosystem context, the integration of Ecosystem Based Management (EBM) principles into management decision-making processes requires explicit attention.** The New Zealand Fisheries Act 1996 does not explicitly require or provide for an ecosystems-based approach to be applied to fisheries management. The consideration of the ecosystem effects of fishing are, however, included in its purpose and principles. Currently, New Zealand still lacks a formal policy or plan setting out how ecosystem effects are to be included in management decision-making processes. In contrast, New Zealand's Conservation Services

Programme has a formal legislative and funding framework to undertake research into, and mitigation of, the impacts of fishing on protected species which has proved effective in focusing attention on the issues and changing behaviour to reduce impacts. Hence, when designing a QMS, consideration needs to be given to how an ecosystems-based approach will be integrated into the system and what provision will be made for it in legislation. ([Section 6a](#))

- **Fishing activity impacts—and in turn is impacted by—the condition and management of the broader marine environment; hence, other relevant marine legislation needs to be considered and mechanisms established for critical fish habitat protection and restoration when designing a fisheries management system.** Since the enactment of the New Zealand QMS, the marine legislative and policy context in New Zealand has become ever more complex, and finding constructive ways to harmonize the QMS with other legislation that affects spatial use of marine ecosystems is a work in progress. Over this same period, the protection and restoration of habitat important for fish productivity, especially in inshore areas (e.g. sea grass beds and shellfish beds) has received limited focused attention. ([Section 5](#))

## Social and Economic Impacts

- **A Quota Management System can increase the economic value of New Zealand fisheries and change how and where value and benefits are distributed amongst stakeholders.** Efficiency and sustainability gains have driven significantly increased economic benefits derived from fishing since the QMS was established. This has come through capacity reductions and technology improvements in the value chain and has inevitably resulted in a reduction in the number of active vessels and a restructuring of the industry. It has also shifted beneficiaries from primarily fishers to a broader range of groups, including iwi, large fishing companies, and shareholders in public enterprises. ([Section 6b](#))



Seagrass bed

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- **Transferable Annual Catch Entitlements (ACE), which are traded separately from quota, enable quota owners to obtain an annual cash flow from their quota asset and for non-quota owners to participate in the fishery.** The ownership of and trading in ACE is central to how the New Zealand QMS operates. Having the right amount and mix of ACE is essential for fishing on targeted species as well as for being able to balance what is actually caught and avoid having to pay a “deemed value” fine for catch not covered by ACE. Access to ACE is a challenge for some independent fishers. At the same time, some iwi that received quota under the Fisheries Settlement have chosen not to engage directly in the fishing industry, but rather use their quota and resulting ACE to generate income for the iwi. ([Section 6b](#))

■ **A Quota Management System can lead to restructuring of the industry away from smaller owner-operated businesses to larger, vertically integrated commercial operations as quota ownership consolidates through trade and seafood businesses develop.** This, in turn, can lead to communities losing once important business and employment opportunities. Social impacts on communities that “lose” fishing businesses can be lessened when there are other economic opportunities for fishers exiting the industry. Opportunities for coastal communities to develop other industries, such as tourism, can be effective in lessening socioeconomic impacts. ([Section 6b](#))

■ **Fishing rights that were allocated to the Māori under the Quota Management System have served to boost institutional development of iwi (tribal structures) and enabled funding of culturally important activities.** Substantial capacity was built with the creation of Mandated Iwi Organisations

(MIOs) that were required in order to receive the quota settlement. As revenue has been generated via different aspects of the settlement (e.g. leasing ACE dividends from Māori-owned Seafood Companies), significant investments have been made by iwi in important cultural and social assets such as Marae construction, language schools, scholarships, and employment training. ([Section 3, 6b](#))

## Indigenous Rights

■ **The Quota Management System provided a vehicle for the recognition of rights not possible under open access.** The QMS has served to address and reinstate the fishing rights of New Zealand's indigenous population (Māori) that were specified by treaty. When establishing a rights-based fisheries management system, there must be full consideration of existing rights, treaties, and/or other traditional systems. When the quota right was recognized by the treaty, it also increased the security and property rights of other quota owners. ([Section 3](#))

■ **The Quota Management System resulted in different management regimes for the multiple aspects of traditional marine resource use.** Resource use by indigenous populations traditionally does not distinguish between commercial, recreational, and customary use, yet the government created separate management systems for these different uses. The QMS only settled the commercial rights of the Māori, and the separate management systems make it challenging to manage shared fisheries. ([Section 3](#))

■ **Continued engagement, advocacy, and investment by the Māori is considered essential for safeguarding and strengthening indigenous rights and co-management under the Quota Management System.** Through TOKM, a Māori-wide organisation, a far-reaching strategic plan has been developed that focuses on the opportunities and challenges that lie ahead if the Māori are to receive and retain the full benefits of their Settlement. ([Section 3](#))

Marae (Māori meeting ground) in Rotorua

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SECTION 2

# The New Zealand Quota Management System

Commercial fishing  
gear

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## SECTION 2

# The New Zealand Quota Management System



## Section 2a: The Context for the Introduction of the Quota Management System into New Zealand

Prior to 1840, the Māori were the sovereign people of New Zealand and consisted of around 85,000 individuals (Bargh, 2016). The Māori had long-standing fisheries institutions and utilized fisheries for commercial, cultural, and recreational purposes. Seafood, or kaimoana, was a critically important part of the Māori diet in New Zealand, as few large land-based animals remained as a source of food after the first two hundred years of Māori settlement. Coastal tribes laid claim to fisheries in coastal areas offshore of their land as part of a complex web of harvest rights developed over generations.

Fish was eaten fresh or dried and was actively traded between coastal and inland tribes (Johnson & Haworth, 2004; McClurg & Arbuckle, 2009).

In the 1800s, as the European population flourished in New Zealand, it became more and more evident that the settlers' relationship with the Māori was in need of governance. To attend to this challenge, British and Māori representatives signed the Treaty of Waitangi in 1840. This treaty established the British Crown as the sovereign of New Zealand but ensured that the Māori would retain 'tino rangitiratanga' (authority) over their resources, including fisheries resources. The treaty formalized a partnership between the two peoples occupying New Zealand (Bargh, 2016). However, the partnership envisioned by the Waitangi Treaty was not realised until 152 years later with the settlement of Māori ownership claims to their fisheries. This is the subject of Section 3. Under the colonial government, fisheries were largely managed under an open access, 'free for all' regime established

in British common law (Scott, 2008). Targeted regulation was implemented by central government for resources under pressure, such as oysters. The New Zealand government established its first Fisheries Act in 1908, further negating the Māori rights acknowledged in the Treaty of Waitangi. The open access regime established by the 1908 Fisheries Act largely persisted through to the mid-1980s, although some efforts were made to introduce restricted licensing in inshore commercial fisheries in the 1930s with the passage of the Industrial Efficiency Act of 1936. This licensing regime was refined further between the mid-1940s and 1963 (Johnson & Haworth, 2004).

### Expansion of New Zealand fisheries in the 1960s and 1970s

In 1963, New Zealand's territorial sea extended seawards for 3 nautical miles (nm). Beyond this mark, deepwater fisheries were predominantly harvested by foreign vessels. In 1965, the territorial sea was increased to 12 nm, accompanied by a rapid expansion of the New Zealand inshore fishing industry, which doubled between 1963 and 1973 (Leal, 2010). The deepwater fishery operating beyond the expanded territorial sea emerged as a new area of government concern. At the time, New Zealand's capacity to utilise the deepwater fishery was non-existent (Johnson & Haworth, 2004), with catch expansion in the deep water throughout 1977 almost entirely driven by foreign fishing efforts (Clark & Duncan, 1986). By the time New Zealand claimed authority over the 200-mile exclusive economic zone in 1978, about seventy percent of New Zealand production was being sent to Japan, the USA, and Europe. But oversupply, particularly in the Japanese market, was depressing prices and putting pressure on rapidly expanding capital investments in vessels and processing capacity (Johnson & Haworth, 2004). At this time, harvesting of deepwater and mid-depth species, such as hoki, squid, and orange roughy, continued to be predominantly licensed to foreign fleets.

During this period, a private sector-led entity called the Fishing Industry Committee argued successfully that the regulatory framework had stifled the growth of the New Zealand fishing industry and its ability to compete internationally. The head of this group became the Minister of Marine in 1963, from which point the Fishing Industry Committee became a governmental organisation called the Fishing Industry Board. Recognizing the Fishing Industry Committee's criticisms, the government removed licensing restrictions in 1964 and implemented a series of subsidies to develop capacity in the New Zealand fishing industry (Johnson & Haworth, 2004).

### Overfishing of Inshore Fisheries and Passage of the Fisheries Act 1983

Until the mid-1970s, inshore fisheries management was governed by a licensing system and was regulated largely through gear restrictions and by confining fishers to certain areas. The long-standing 1964 government programme of providing tax breaks, grants, allowances, and other investment incentives to promote fishing caused an influx of subsidized new entrants into the inshore fisheries. This resulted in over-capitalization in the fishery and severe stock depletion of key inshore fisheries, such as snapper.

Sharp (2005) reports that by 1981 some 42% of catch was taken by large inshore trawlers over 59 feet in length with little or no profitability (Leal, 2010). In *Hooked: The Story of the New Zealand Fishing Industry* (2004), Johnson and Haworth record the state of the key inshore snapper fishery in 1983 as follows: "From peak recorded landings of 17,700 mt at all ports, snapper landings had fallen to 12,000 mt in 1980 and 1981. By 1983, ... snapper landings had fallen to 8700 mt." A large proportion of this catch, about 6500 tonnes, was recorded as caught in the SNA1 fishery (see Figure 2).

By the mid-70s, industry was pushing for government controls over fishing efforts. The inshore industry in New Zealand faced a fish stock calamity in the making. In response, the government passed legislation in 1977 to establish "controlled

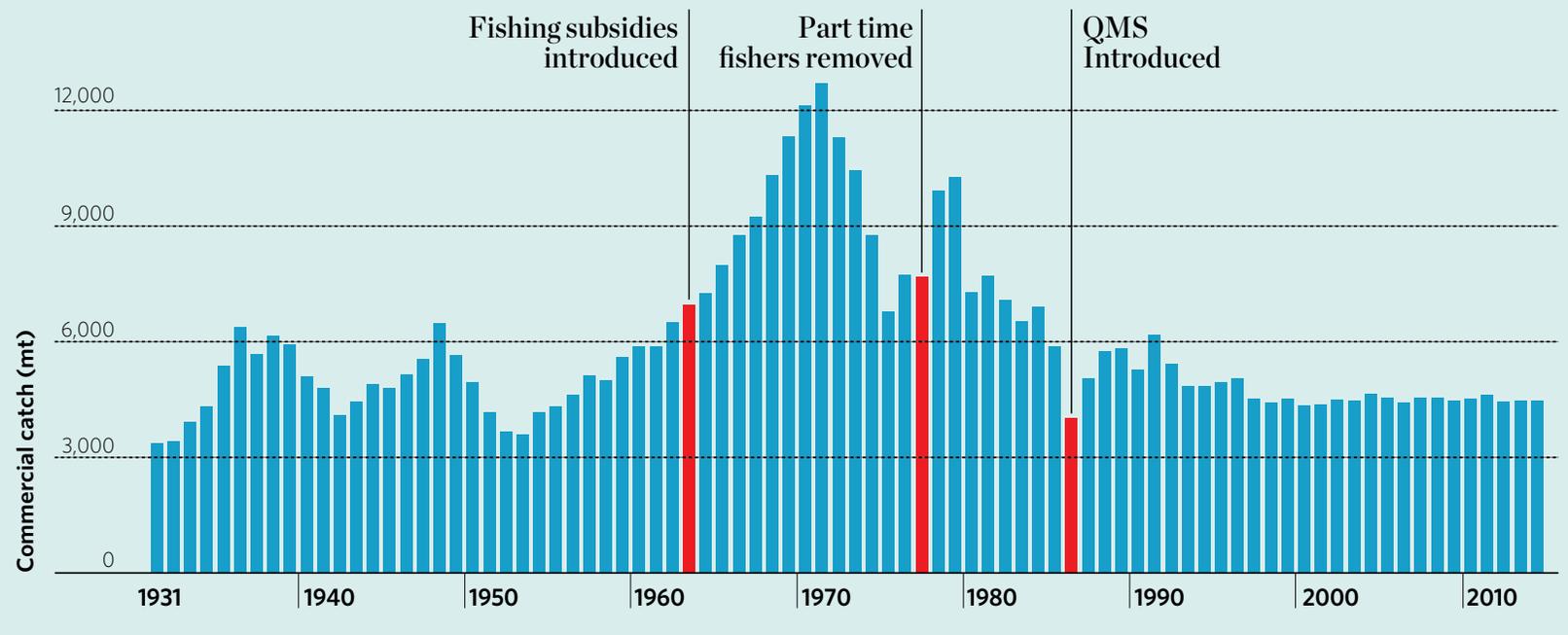
fisheries." In the face of increasing concern from both recreational and commercial fishers, a series of moratoriums and controls were issued over the following years, culminating in a 1982 moratorium over all new entrants to the inshore fishing industry for all species (Bargh, 2016; McClurg & Arbuckle, 2009).

Within this context, a new Fisheries Act was introduced in 1983. The 1983 act provided for the development of fisheries management plans based on regulations and input controls to address fisheries problems (Leal, 2010). In addition, the new act cancelled 2,260 "unused" or "part-time" fishing permits without compensation, which represented about 46% of permits issued at that time (Johnson & Haworth, 2004). The

timing of this change coincided with changes in New Zealand's taxation rules making the cash sales that were key for many part-time fishers no longer viable. While the removal of part-timers was aimed largely at removing catching (or potential catching) capacity, it proved to have minimal actual effect on reducing overall fishing efforts (Johnson & Haworth, 2004). The removal of part-time fishers did, however, significantly affect future QMS allocations for inshore commercial fishing and had a significant impact on many fishers and their families, particularly among the Māori (Bargh, 2016).

The dislocation caused by the removal of part-time fishers would be remembered in the debates leading up to the establishment of the QMS as well as in the Māori legal challenges that followed.

**FIGURE 2.** Historical catch of snapper in New Zealand's key snapper fishery showing historical events of subsidy introduction, part-time fisher exclusion, and QMS introduction



To this day, the blunt application of this measure has had repercussions for fishers from all sectors. This is because there was little distinction between recreational, customary, and commercial fishing before part timers were removed. Recreational fishers, for example, could also catch and sell fish as part-time fishers. Likewise, many Māori fished part time to supplement other income as well as providing for their own needs. The manner in which the QMS was introduced, based on commercial catch history after the removal of part-time fishers, entrenched the distinction between the harvesting rights of differing sectors. Harvests taken for recreational and customary purposes were redefined as fish taken for purposes other than sale and were left to be managed under existing regulatory measures.

## New Zealandisation of Deepwater Fisheries

Deepwater stocks followed a different trajectory leading up to their introduction into the QMS. They were influenced by the United Nations Law of the Sea (UNCLOS) negotiations, which culminated in the establishment of the exclusive economic zone (EEZ) in 1978 and the ultimate ratification of the UNCLOS. With the EEZ established, the government introduced a policy of “New Zealandisation” to encourage New Zealand seafood companies to invest if they wished to operate within the EEZ. This included loans for vessels and processing facilities and the development of export markets. Import taxes were waived on foreign-bought vessels. Aligned with this investment goal was an active government policy that facilitated New Zealand companies to establish joint ventures with foreign fishing companies to fish within the New Zealand EEZ (i.e. outside of the 12 nm Territorial Sea). Government extended benefits to joint-venture companies, treating them as domestic enterprises and granting them preferential access to fish in the EEZ. Foreign companies scrambled to satisfy the joint-venture provisions and secure these benefits. In consequence, New Zealanders were quickly integrated into the crews of foreign vessels and more fish were landed in New Zealand for processing. Direct fishing by foreign fleets rapidly

## Impact of Part-Time Fisher Removal on Māori

The Waitangi Tribunal recorded the impacts of the 1982/83 decisions to remove commercial part-time fishers on the Muriwhenua people, a group encompassing the five Māori tribes located in the far north of New Zealand: “Māori objected but to no avail. For the Muriwhenua people it meant simply that the whole of ‘their’ fisheries were invaded, as both small and large operators worked their way north to the extensive Muriwhenua coastline... it was essential for the Muriwhenua people that they should seek to survive as individual fishermen within the alternative fishing regime that was imposed. Their livelihoods, families and communities depended upon their doing so. In the time honoured way however, they were part-timers, sharing commitment between their ancestral lands and seas. So it was that the Muriwhenua Māori lost not only ‘their’ fish to outside fishermen, as the grounds they had nurtured for centuries were largely fished out, but their fishing livelihoods too, and their ancient association with the seas was virtually ended” (Waitangi Tribunal, 1988, p. xviii).

declined as joint ventures were integrated into the domestic industry. In these early days, however, foreign fleets continued to provide the infrastructure needed to fish deepwater zones. Under this policy, the value of exports increased five times in as many years beginning in 1979 (Leal, 2010).

The allocation framework that was instituted, giving preference to domestic and joint-venture companies over foreign companies, resulted in New Zealand’s first ever catch limits to regulate foreign take. The limit was calculated as the difference between domestic and joint-venture take and sustainable yield; there was no corresponding catch limit set to limit domestic take (Connor, 2001b; Johnson & Haworth, 2004). Development of New Zealand’s deepwater fisheries in the EEZ was so successful that Government introduced quotas, termed “Enterprise Quota,” for each of the main deepwater species in 1983. These quotas were the forerunners to the QMS. Enterprise Quota were allocated to companies who had existing vessels, processing facilities, and catches of deepwater species. In 1986, these quota were transferred into Individual Transferable Quota under the new QMS.

To summarize, New Zealand commercial fishers and companies were reluctant to invest in costly equipment required in deep-water fisheries without some kind of security of access to the stocks that were also being fished by foreign fleets. Enterprise Quota, a forerunner to the QMS, were first introduced in 1983 to provide this security and incentivize entrance of New Zealand actors into the deepwater fishery. This system, known as “deepwater enterprise allocations,” was introduced for seven deepwater fish species (Sharp, 1997). Thus, the individual quota system was initially utilized not as a sustainability control to address over fishing but to enable economic development of New Zealand-based infrastructure in deepwater fisheries.

A fishing trawler at port in Auckland

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## The Economic and Political Context in Which New Zealand's Quota Management System was Introduced

By 1984, after years of economic intervention aimed at subsidizing primary industry development and implementing “think-big,” centrally driven projects, New Zealand faced both a constitutional and currency crisis. The Fourth Labour Government, headed by Prime Minister David Lange, rose to power swiftly in a snap election and immediately introduced extensive economic and institutional reforms. Just as former Prime Minister Margaret Thatcher of Great Britain and President Ronald Reagan of the United States sought to foster free-market changes, so too was the Minister of Finance of New Zealand, Roger Douglas, pursuing a free-market agenda: “Rogernomics.”

In a very short span of time, and arguably more comprehensively than elsewhere in the world (Douglas, 1993), New Zealand changed from a system of centralized government control to a market-based economy. The government floated the New Zealand dollar, removed import controls, lowered tariffs, removed agricultural subsidies, reduced central spending, reformed the public sector, and changed the tax system. The shift in government policy during this period was so dramatic that some commentators have described it as a political and economic “revolution” (Boston, 1987).

It is easy to attribute the QMS in New Zealand to the Fourth Labour Government and the free-market policies aimed at privatizing state assets. Indeed, it could not have been implemented as extensively and rapidly as it was without the economic shift that this government oversaw. It is important to note that the QMS's initial design was supported by two consecutive governments and evolved as a practical response to wider global and national economic pressures in addition to a series of specific economic and environmental factors impacting the fishing industry. It was this combination of circumstances that underpinned the QMS introduction process.

Principles for improved fiscal and public-sector accountability in New Zealand were also introduced as part of several “free-market” reforms passed into law in the 1980s.<sup>1</sup> This new legislation established the framework for public-sector fiscal accountability by making Ministers (rather than departmental heads) directly responsible for appropriation expenditures, expressed as defined “outputs,” that were to be delivered by a Ministry or Department.

**The QMS's initial design was supported by two consecutive governments and evolved as a practical response to wider global and national economic pressures in addition to a series of specific economic and environmental factors impacting the fishing industry.**

This fiscal framework increased Ministers' accountability for public expenditure, but also increased the level of political engagement in fisheries management by linking Ministerial/Government political priorities to departmental expenditures on regulatory processes. In fisheries, these processes included setting the Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) as well as setting cost recovery levels and research and enforcement priorities. As will be described in Section 2d, the “outputs” defined to determine budgets for activities such as fisheries research and enforcement became particularly important to the QMS because they defined the Crown's expenditure relative to services that would be cost-recovered or delivered under devolved-service delivery approaches in the future.

By 1984, under the new economic and institutional agenda described above, the Fisheries Act 1983 was no longer considered adequate for the effective management of fisheries given the track record to date. As a result, the government, backed by industry leaders, moved to fast track a reform based on quota management to be applied across all major commercial fisheries in New Zealand.

1. *The Official Information Act 1982, the State Sector Act 1988, the Public Finance Act 1989, the Reserve Bank Act 1989, and lastly the Fiscal Responsibility Act 1994*

Consultation on the proposal to introduce the Quota Management System centred around two policy documents. The first, a 1983 discussion paper on future policy for the inshore fishery known as the “Green Book,” documented the perilous state of inshore stocks, the economic overinvestment in fishing capacity, and the need for urgent action. The “Green Book” proposed options for reform that were split between pursuing a government-run fisheries management plan model, accompanied by a government buy-back of effort, or the implementation of a quota management system (QMS). Of the two options, the QMS was viewed as a more effective and faster response. The second document, known as the “Blue Book” (1984), centred on a proposed policy for the inshore fishery and included a rudimentary design for a system of management founded on the allocation of Individual Transferable Quota (ITQ) for all major commercial fisheries in New Zealand. Key features of the “Blue Book” proposal were that initial quota would be a fixed tonnage allocation, with allocations made to fishers based on their historical catch records. Catch reductions under this system were to be implemented through a buy back scheme funded through central taxation. This set an initial incentive framework that placed both the responsibility and the onus on Government for setting and adjusting sustainability measures, such as total catch limits and other regulatory controls. It also provided a degree of flexibility in the use of quota rights once allocated, such that fishers could determine, within these limits, when and how they could go about the business of fishing. At the time, concerns raised by industry about the new system focused on the fairness of the criteria used for establishing catch history and future quota allocations and the need for compensation for lost access (Johnson & Haworth, 2004).

## Introduction of the Quota Management System (1986)

The Quota Management System was fully introduced in 1986 as an amendment to the Fisheries Act 1983. The original deep-water quota set under the 1983 act was transformed to tradeable property rights granted in perpetuity. Inshore fisheries

were brought into the system with an initial 26 species and the expectation that further species would follow. While the Fisheries Amendment Act of 1986 did not specifically state the purpose of Individual Transferable Quota (ITQ) based management, Crothers (1988) observed that the QMS was initially introduced with two main aims:

- **Conservation:** to limit catches that will result in maximum production from the stock.
- **Allocation:** to maximize efficiency and the net economic return to the nation.

Thus, the initial QMS design in New Zealand was primarily aimed at the rationalization of fishing efforts and the introduction of output controls within the commercial catch sector. It relied on other laws and regulations to address the effects of fishing on sea bird and marine mammal populations and marine habitats (Pearce, 1991). Rather than being a comprehensive management system, the QMS was introduced as a supplement to the existing, centrally planned regulatory framework. It was an extension to, and was defined by, decisions already made to limit access under regulation and through other environmental legislation.

The existing regulatory framework and its specific regulations were left largely unaltered, and many remain largely intact to this day. They have also been added to, with the number of fisheries regulations doubling from around 4,000 to 8,000 since the QMS was introduced (Walshe, 2010).

Under the initial QMS, quota was allocated as a fixed amount of fish (tonnage) that a quota holder was allowed to harvest. This approach kept both the responsibility and authority for management, as well as the financial consequences of management decisions, within Government. In other words, Government could auction unallocated quota, but needed to compensate fishers (buyback quota) if the status of a particular fish stock was unable to support the harvest of all the quota that had been allocated. Yet "Buy-backs" were expensive for Government (Sharp, 1997), so it sought to recover some



Parliament buildings  
in Wellington

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economic value through the establishment of a resource rent tax on quota. Resource rentals were set at specified rates on each ton of quota held or each ton of non-QMS catch taken.

By 1987, 29 species had been introduced into the QMS based on commercial fisher catch history and with consideration to fishers' commitment to, and dependence on, fishing. Further introductions were put on hold, however, pending the outcome of Māori litigation which challenged the allocation process of the QMS over the Māori's right to the "exclusive and undisturbed possession" of fisheries resources guaranteed under the Treaty of Waitangi. This litigation also brought into debate whether the Crown had the right to recover resource rentals given that fisheries resource ownership, and by association the right to collect rent from that ownership, was in dispute. (See Section 3 for more details on Māori rights and the QMS).

In 1990 the Government changed its quota allocations from fixed tonnage quota to proportional quota (i.e. a fixed proportion of the annual Total Allowable Catch). As discussed in more detail below, this was significant because it shifted the consequences (both positive and negative) of changes in stock abundance away from Government to the quota owners themselves. Linked with the change to proportional quota was the introduction of Annual Catch Entitlements (ACE), giving a quota holder the right to take a certain weight of a fish stock during a fishing year.

## Section 2b: Key Components of the Quota Management System

The New Zealand QMS as it exists today has evolved significantly since its inception in 1986 to become a more complete system of fisheries management. It has expanded its scope with extensive changes to its administration and by increasing the number of species managed. From managing 26 species in 1986, it now manages 98 species or species groups comprised of 642 stocks. Understanding the key components of the QMS, the changes over time, and the context in which these changes occurred is the focus of this section.

The key components of the QMS include: the Individual Transferable Quota (ITQ), the Annual Catch Entitlement

(ACE), the Total Allowable Catch (TAC), and the Total Allowable Commercial Catch (TACC). These components interact and depend on each other; understanding the nuances of each as well as how they have changed over time is critical to fully comprehending the New Zealand QMS. The box below briefly describes these key components and Table 1 summarizes the most significant changes between the original 1986 QMS and the system today (2017).

### Objectives of Fisheries Management under the Quota Management System

When the QMS system was first introduced, the objectives for the system were not made explicit. This changed with the Fisheries Act 1996, which was the first New Zealand fisheries statute to contain an explicit purpose: *"to provide for utilisation*

### Key Components of the Quota Management System

**Individual Transferable Quota (ITQ):** Originally, in 1986, the ITQ was a right to harvest a defined tonnage of fish (a quota) within a defined geographic area. The quota was an asset that was owned in perpetuity and was divisible and tradeable subject to minimum and maximum ownership limits. Over time, the quota evolved to represent a share in the fishery expressed as a perpetual right to generate an annual catch entitlement set within a defined area. Quota ownership is now registered and can be caveated and mortgaged.

**Annual Catch Entitlement (ACE):** This is a catch right that gives a quota holder the right to take a certain weight of a fish stock during a fishing year. Each quota holder receives an ACE annually. ACE is allocated proportionally based on the number of quota shares held at the beginning of each fishing year for each stock managed under the QMS. ACE rights are traded independently of quota shares once they are generated.

**Total Allowable Catch (TAC):** The TAC is set for a particular fishery, generally for a year or a fishing season. The legislation requires TACs to be set at or above a level that can produce Maximum Sustainable Yield (as qualified by economic, environmental, and other factors) and are usually expressed in tonnes (mt) of live-weight equivalent or in terms of numbers of fish. In the New Zealand QMS of 1986, the TAC was set for commercial catch after allowing for non-commercial interests. Since then it has changed to account for all fishing-induced mortality, including recreational and customary non-commercial catch as well as discards and illegal harvest.

**Total Allowable Commercial Catch (TACC):** A TACC is a catch limit that is set just for the commercial catch in a given fishery for a year or a fishing season. The TACC is never set higher than the TAC.

**TABLE 1.** Main Attributes of the QMS as Originally Introduced (1986) in Comparison with 2017

QMS attribute	QMS as initially introduced in 1986	QMS in 2017
<b>Quota right</b>	A right to harvest a defined tonnage of fish (a quota) within a defined geographic area that was perpetual, divisible, and tradeable subject to minimum and maximum ownership limits. Quota reductions, in large part, were made by the government purchasing quota on the open market.	A share in the fishery expressed as a perpetual right to generate an Annual Catch Entitlement (ACE) as a proportion of the Total Allowable Commercial Catch (TACC) set within a defined area. The share is divisible and tradeable with few ownership limits, and the area in which it applies can be amalgamated and subdivided. Quota ownership is registered and can be caveated and mortgaged. Quota reductions resulting from TACC reductions are not compensated and quota increases are not charged for.
<b>Quota allocation</b>	ITQ was allocated based on a combination of recent catch history and fisher commitment and dependence.	20% of ITQ in all new fisheries is allocated to the Māori. Catch history, if present, now only relates to fishing that occurred in 1991/92. Quota is allocated as a proportion of the initial TACC set and any unallocated quota is sold by the Crown by tender.
<b>QMS objectives</b>	No explicit objectives were set for QMS management.	Explicit purpose, set in law, is to “provide for the utilization of fisheries while ensuring sustainability.”
<b>QMS preference</b>	The QMS was established to supplement the existing regulatory and planning processes. Only economically important stocks were placed under QMS management.	QMS is effectively the default management response to address utilization and sustainability threats in fisheries. All stocks requiring management intervention are under QMS management.
<b>Māori fishing rights</b>	Māori fishing rights were not recognized in initial ITQ allocations.	The QMS is now subject to the full and final settlement of Māori claims to fisheries.
<b>TAC and TACC setting</b>	TAC was set for commercial catch after allowing for non-commercial interests.	TAC is set for all fishing-induced mortality, including recreational and customary non-commercial catch, discards, and illegal harvest. TACC is set no higher than the TAC.
<b>Environmental matters</b>	No explicit environmental purpose or principles were set for QMS management.	Explicit purpose, set in law, includes “ensuring sustainability” and is accompanied by a set of environmental principles which fisheries decision-makers must take into account.
<b>Catch balancing</b>	ITQ and a fishing permit were required to fish commercially. Catch had to be balanced against quota held. ITQ had to be held in advance of fishing. It was an offence to catch fish in excess of 10% of ITQ held. Over-catch of up to 10% had to be counted against future ITQ or in some cases could be balanced against ITQ from associated species.	A fishing permit, not ITQ, is the authority to fish. ITQ generates an ACE that can be freely traded independent of quota shares. Catch must be balanced against ACE once caught. ACE does not need to be held in advance of fishing. Deemed values are payable monthly and annually for any catch taken in excess of ACE. Deemed values paid are treated as government receipts. Non-payment of deemed values is an offence and results in loss of permit.
<b>Cost recovery / Resource rentals</b>	Costs of management were fully paid for by the Crown. No costs were recovered. Resource rentals were payable at specified rates on each mt of quota held or each mt of non-QMS catch taken.	Management costs attributable to commercial fishing are fully recovered, including enforcement costs. These costs include costs of regulatory advice, monitoring and administration, some science and research, and enforcement (set annually). No resource rentals are payable.
<b>Public sector accountability and service delivery</b>	Public sector accountability in the State Services was separate from Ministers. Provision of policy and delivery of supporting services was within one ministry. All fisheries administration functions and services were delivered by an agricultural sector-wide Ministry: the Ministry of Agriculture and Fisheries. Research was provided by a division of the Ministry of Agriculture and Fisheries.	Ministry chief executives are explicitly accountable for delivery of Outputs in contract to their relevant Minister. Provision of policy and delivery of services are largely split. Policy advice functions are delivered by a primary sector-wide ministry: the Ministry for Primary Industries. Research is contracted out. Most research is contracted to the National Institute of Water and Atmospheric Research which is a government-owned research institute.

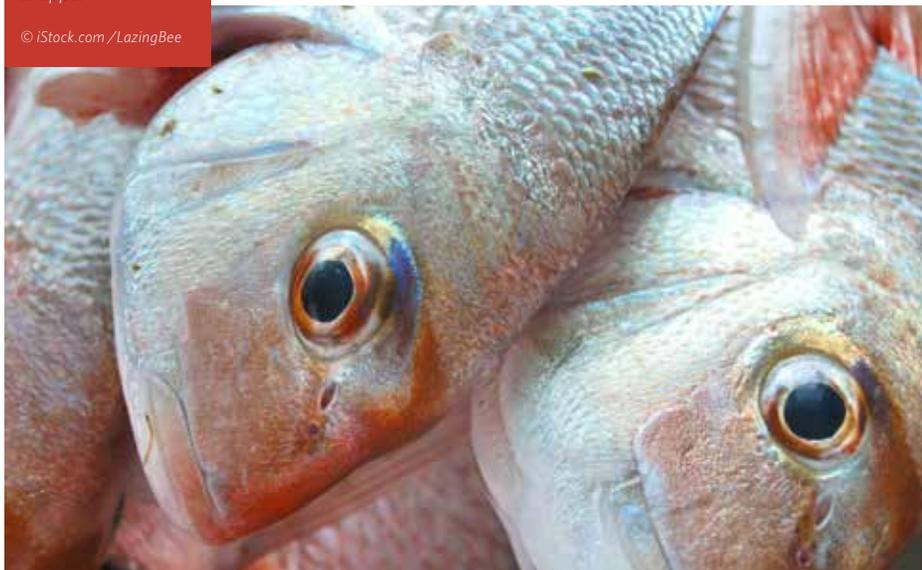
of fisheries resources while ensuring sustainability." In this context "provide for utilisation" is defined as "enabling economic, cultural and social wellbeing"; the term "ensuring sustainability" includes the requirement to "maintain the potential of fisheries resources to meet the reasonably foreseeable needs of future generations" and "avoiding, remedying or mitigating any adverse effects on the aquatic environment."

The significance of "providing for utilisation" is succinctly explained in a 2001 Ministry of Fisheries policy interpreting the purpose of the Fisheries Act:

"... 'provide for utilisation' means, in New Zealand's liberal democracy, to provide people with the opportunity to maximise their utility (as in the definition of 'provide for their social, economic and cultural wellbeing') ... This implies that the core role for those exercising powers under the Fisheries Act is to establish the framework within which people can make their own utilisation decisions. This framework includes sustainability constraints and the specification of property rights of those entitled to utilise fisheries resources."

Freshly caught  
snapper

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## The Nature of the New Zealand Individual Quota Right

Individually Transferable Quota (ITQ) rights were initially allocated as a right to harvest a managed species (or group of species) within a spatially defined area known as a Quota Management Area (QMA). There are 10 base fishery management areas used for setting ITQs (Figure 1), but different areas are used for some species. For example, the mid-depth hoki fishery is defined as a single stock, hence the management area and the quota applies to the whole of the New Zealand EEZ even though two sub-stocks are managed separately. For some stocks, QMAs align with biological stock boundaries, but in other cases the QMAs either include several biological stocks or only part of a stock.

Under the initial QMS, quota was allocated as a fixed amount of fish (tonnage) that a quota holder was allowed to harvest. In 1990, however, quota became proportional. The New Zealand ITQ is a strong property right even amongst highly developed countries (OECD, 2006). The attributes that determine the "strength" or "quality" of a property right as described by Scott (1988), as well as how those attributes are reflected in New Zealand, are described below.

**Exclusivity:** The ITQ is a right to harvest a particular proportion of a species (or group of species) within a specific QMA. ITQ ownership within an area does not exclude use by other fisheries sectors, such as customary and recreational, or non-fisheries uses of the marine environment, such as marine reserves or marine farming. However, such non-fisheries activities are constrained to varying degrees where they impact fishing (see Section 5). The extent that an individual ITQ owner can avoid interference by other resource users in the maritime environment, as well as the exercise of powers to allocate rights away from fishing, affects the quality of the ITQ right. Two significant

**The New Zealand ITQ is a strong property right even amongst highly developed countries (OECD, 2006).**

changes have occurred to the ITQ right since it was introduced in 1986. The first, and most notable, was the introduction in 1990 of proportional quota, which replaced fixed tonnage allocations. Under this change, the ITQ right became subject to reallocation to and from other uses, most notably recreational and customary fishing, without compensation due to changes in how the total catch limits were set (see further discussion below on TAC and TACC). Second, ITQ rights in a range of fisheries and locations can and are becoming increasingly impacted by other proposed uses of the marine space (e.g. marine reserves, marine farming, and sea-bed mining) as well as by more diffuse impacts such as habitat degradation from land-sourced sedimentation.

**Duration:** Duration is measured as the length of time the owner has the power to exercise the ITQ right. Unique to New Zealand, the ITQ was issued in perpetuity from the outset of the QMS. However, the Māori legal challenge to the ITQ introduced some uncertainties regarding the strength of this tenure until a settlement was reached with the Māori in 1992 (see Section 3). The settlement allocates a share of the quota to the Māori in recognition of their entitlement as expressly provided for in the Treaty of Waitangi. This decision effectively reinforced the perpetual and enduring nature of the New Zealand ITQ right.

**Flexibility:** Flexibility of the ITQ relates to the ability of the rights holder to manage, dispose of, and receive income and enjoyment from the right. Flexibility within the QMS is constrained by a range of regulatory processes, in particular by the TAC- and TACC-setting processes. Management still occurs largely through government processes, although a range of efforts (see Section 4) have been made to allow rights holders to undertake management activities aimed at increasing ITQ value.

**Quality of title:** Quality refers to the strength of the ITQ right and how secure it is against reallocation to other uses. The move to proportional quota allocation in 1990 was arguably a weakening of the quality of the New Zealand ITQ right, particularly in inshore shared fisheries, as it opened the door for



Rock lobster on the seafloor

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reallocation of fishing rights to other uses (i.e. recreational and customary sectors). The settlement of Māori claims, on the other hand, clearly strengthened the ITQ right, first by removing political uncertainty around the legitimacy of ITQ allocation and second by affording the protection of the right as part of a treaty settlement. The quality of title afforded to ITQ was further strengthened by the establishment of a government-guaranteed quota register improving the legal quality of ITQ title and the ability to caveat and mortgage such rights.

**Transferability:** Transferability is a key attribute of property under the QMS, as it allows for the establishment of an ITQ market. ITQs were initially established as freely tradeable rights, though limited to New Zealand ownership. A New Zealand-owned corporation was defined as an entity with 75% stock ownership by New Zealand interests. Even so, the Minister was given discretion to allow higher foreign ownership where it was in the best interests of New Zealand. This discretion was exercised to allow a 50% New Zealand ownership of Sealord Limited, for example, with the remaining share allocated to the Māori in partial settlement of indigenous claims. The Māori settlement also brought some constraints

on transferability with respect to the quota allocated to the Māori tribes: before 1992, 10% of Māori-allocated quota could only be sold amongst tribal groups rather than on the open market; the restriction was raised to 20% thereafter.

**Divisibility:** Divisibility is a subset of transferability in that it defines an ability to subdivide or aggregate the ITQ right. The QMS initially allowed divisibility subject to a range of aggregation limits which applied differently to each species. These limits were more conservative in inshore fisheries, such as

abalone and rock lobster, than in deepwater fisheries. Inshore fisheries at the time were fished largely by owner operators. The higher maximum-quota ownership thresholds in the deepwater fisheries allowed the large companies to purchase quota from the government and increase their holdings. ITQ rights are now expressed as a shareholding in a fishery, defined as a stock. One hundred million shares are issued in each stock and no limits exist as to how share parcels can be subdivided.

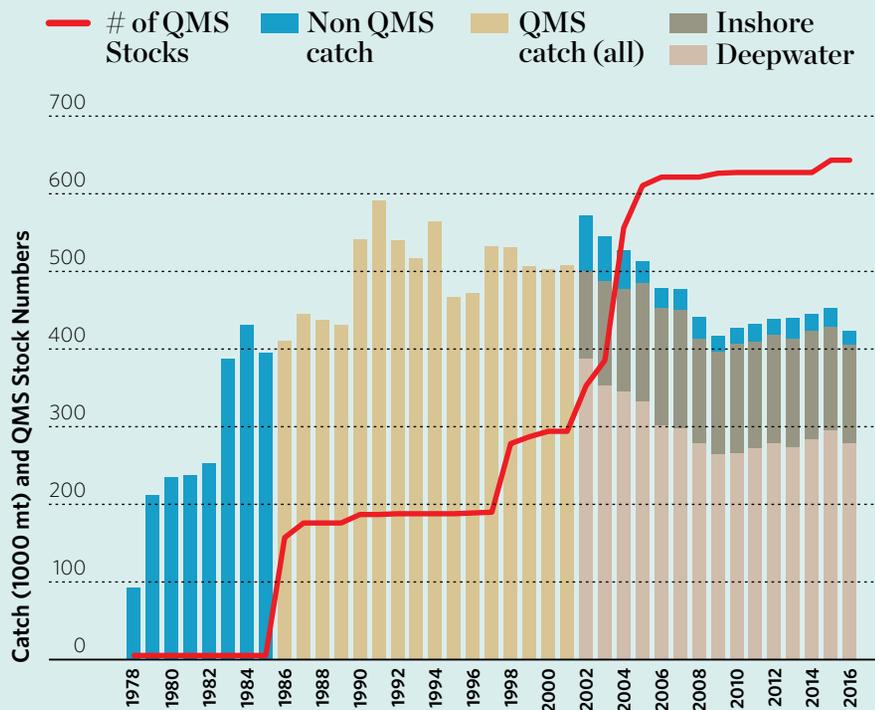
## Adding Species to the Quota Management System

Throughout its history, the QMS has changed from being a mechanism to supplement existing fisheries management to being the prime tool applied to fisheries management in New Zealand. Consequently, the process of allocating ITQ rights to particular fish stocks has evolved over time. When the QMS was established, only 26 species comprised of 153 stocks were placed under QMS management. In 1996 the government adopted the QMS as its preferred management system for commercial fishing activities, thereby facilitating and encouraging new species to be introduced into the QMS. In 2017, the QMS incorporates essentially all commercial fisheries requiring management intervention, which includes 98 species or species groupings comprised of 642 stocks (see Figure 3). It is important to recognize, however, that not all stocks that are part of the QMS system are actually harvested. Currently, 292 stocks are considered “nominal” stocks, meaning that they have no TAC, are not harvested commercially, and have not been demonstrated to have commercial potential.

## Quota Allocation and Quota Ownership Profile

It is important to recognize that the QMS was not introduced into a vacuum. By 1986, government interventions in the permitting process set the scene for the initial introduction of 26 species under the QMS. At the time, restrictions on new entrants, the exclusion of part-time fishers in inshore fisheries

**FIGURE 3.** New Zealand's total marine catch, including inshore, deepwater/mid-depth, and non-QMS catches



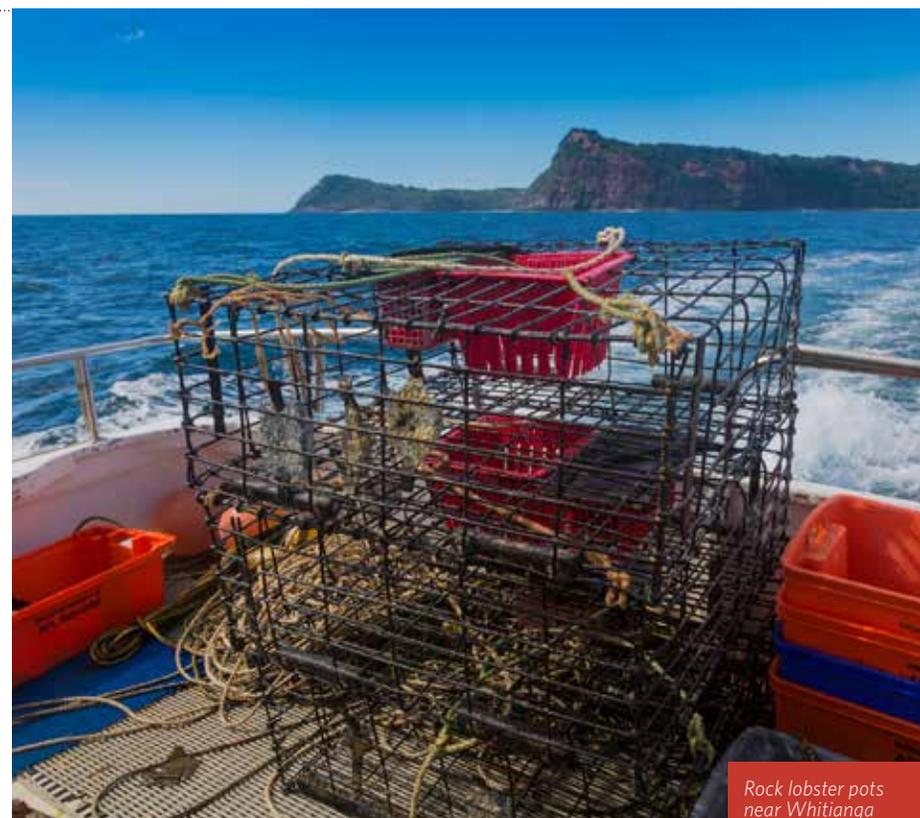
Data between 1986 to 2001 was unable to be categorized due to data limitations.

from gaining future quota, and the establishment of individual quotas for deepwater permit holders all influenced the development and shape of the QMS as originally introduced. For instance, ITQ rights in the deepwater fisheries were introduced by simply converting the existing individual deepwater allocation allowances for seven deepwater species<sup>2</sup> (issued for 10 years) into ITQ rights held in perpetuity.

Inshore fisheries quota was allocated differently; it was done on the basis of catch history recorded between 1981 and 1984. Fishers were provided with an allocation based on their best two years of catch history during that period. Resulting allocations could be reviewed by a quota-appeal authority, and the initial allocations could be increased if a fisher's commitment and dependence on fishing were not well reflected in the allocation. One of the consequences of this quota allocation process, however, was that quota allocations in many inshore fisheries exceeded the initial TAC levels set. To partly reduce quota to TAC levels, the government introduced a buyout scheme. The remaining quota was then reduced proportionately until the total allocations equalled the TACs set. These reductions were not compensated, but those who lost quota were given the first right to any future quota increases at no cost. Ongoing quota appeals continued to impact the process for many years to come (Lock & Leslie, 2007).

By the time the first five years of the QMS was coming to an end, the management of fisheries outside the QMS was becoming increasingly problematic. As QMS catch levels declined and quota became less available, vessel owners increasingly targeted non-QMS fisheries as an alternative source of income. Fishers had also learnt that quota was of considerable value and looked to establish catch histories in non-QMS fisheries, hoping for future allocations if those fisheries entered the QMS. At the same time, as well, Māori legal claims had only been settled on an interim basis and only covered the 172 stocks already introduced into the QMS. In an effort to control the increased pressure on non-QMS stocks, the government

<sup>2</sup> Total quota for deepwater allocations of 130,100 mt were allocated by species amongst ten companies and cooperatives, with 5.5% retained for competitive fishing.



Rock lobster pots near Whitianga

© Raewyn Peart

moved to place an interim moratorium on fishing permits. While the moratorium was intended to be short term, it became the foundation for the evolution of the QMS-allocation framework legislated under the Fisheries Act 1996.

The current quota-allocation process used for adding new stocks to the QMS is different from the original approach. The Māori settlement, which requires that 20% of all quota in new fisheries introduced is allocated to them, reduces the issued quota proportionally to equal 80% of the Total Allowable Commercial Catch. The current system also removed the quota-appeal process, and catch history years are now set as the two years immediately prior to the introduction of the permit moratorium in 1992. In those instances where total catch histories are less than 80% of the set TACC, the excess, or "headroom," is allocated to the Crown for sale.

### The Evolution of Quota Ownership

When the QMS was introduced in 1986, the total ITQ allocated was 520,901 mt, with 61% of this allocated to 1,472 permit holders and the remainder (39%) retained by the Crown to be sold. In deepwater/mid-depth fisheries, almost half of the quota was allocated to New Zealand's top 12 fishing companies. In New Zealand's largest fishery, hoki, the Crown sold nearly half of the quota initially allocated (some 116,000 mt) with a nominal value of \$53 million NZD. Significant Crown sale of quota in other fisheries also occurred, increasing revenues to the Crown by \$83 million NZD (Johnson & Haworth, 2004).

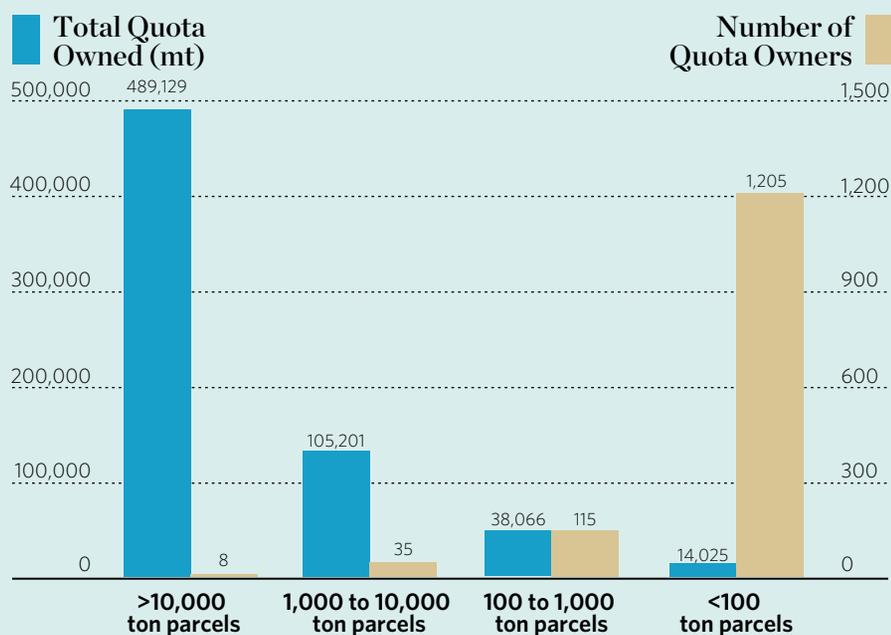
By 1990 it was clear that major TAC reductions were required for some species in both the deepwater and inshore fisheries, albeit for different reasons. In the deepwater

fisheries, boom catches associated with fishing virgin stocks lessened over time, while quota appeals had raised quota allocations well above the TACs and sustainable yields in inshore fisheries. The high cost of potentially "buying back" excess quota under the original fixed-tonnage allocation scheme led the government to move to a proportionality-based system under an accord with the fishing industry, represented by the Fishing Industry Association (FIA). This accord froze resource rents for five years and used the income received from these rents to compensate quota reductions. In return, the industry accepted that quota rights would change from being fixed tonnage rights to proportional shares in the TACC.

As a result of allocations and investment in quota, the processing and market sectors of the industry, who were also represented by the FIA, now had a direct interest in the catching sector and its development. The large, vertically integrated companies looked to secure quota and catch rights to underpin their investment in value-chain development and to secure the efficiencies of scale and increased profit promised under the QMS. For the first five years of QMS implementation, the quota market was very dynamic; as many owner operators looked to exit the market, TAC adjustments were made (up and down) and opportunities to sell and purchase quota arose as the Crown entered the quota market. During this time, the Fishing Industry Association became highly active in the political processes of fisheries management, particularly around the process of setting total catch limits and resource rents (Johnson & Haworth, 2004).

By 1996, the Crown had either sold its quota holdings or allocated them to the Treaty of Waitangi Fisheries Commission through the settlement of indigenous claims. Many of these holdings were purchased by the top five companies, including Sealord Products Ltd, of which 50% was now Māori-owned. In total, 41% of the quota in the market remained in the same hands it had been allocated to in 1986, 39% had been purchased or allocated from the Crown, and 20% of the quota had traded out of original hands (Clement & Associates, 1996).

**FIGURE 4.** The number of quota owners and total quota owned by size parcels in 2016



By contrast, the number of quota owners in inshore fisheries decreased markedly, as catch limits in some key species were decreased to promote stock rebuilding and sustainability. In the snapper fishery, encompassing 50% of inshore catch, some 555 of the 750 entities who were allocated initial quota sold out. By 1996, registered quota owners in the snapper fishery, including about 250 new entrants, totalled 341. While the number of quota owners was reduced

**In 2012, some 28% of all quota shares in New Zealand were owned in trust by iwi (Māori Tribes), owned by iwi companies, or held in shares of New Zealand's largest seafood company, Moana NZ Ltd.**

considerably between 1986 and 1996 away from fisher owner-operators, the number of indirect beneficiaries has increased, both through the public listing of New Zealand's second largest seafood company, Sanford, and through the Māori settlement process.

The Māori are now significant collective quota owners in every marine and freshwater species included in the QMS, owning as much as 50% of quota for high-value species such as koura, pāua, hoki, orange roughy, squid, and snapper (Te Ohu Kai Moana, 2017).

Overall, in 2012, some 28% of all quota shares in New Zealand were owned in trust by iwi (Māori Tribes), owned by

iwi companies, or held in shares of New Zealand's largest seafood company, Moana NZ Ltd (Te Pūtea Whakatupu Trust, 2014).

Between 2002 and 2016, the number of small-parcel quota-owner entities (<100 mt/yr) declined from 1,357 to 1,205, while the number of medium parcel (100-1,000 and 1,000-10,000 mt/yr) quota-owner entities increased from 109 to 158. During this period, medium parcels increased in the proportion of the total quota owned, from 15% to 22%, while the large parcels decreased from 83% to 75% (see Figure 4).

## Setting Total Allowable Catch and Total Allowable Commercial Catch under the Quota Management System

The Total Allowable Catch (TAC) is set for a particular fishery, generally for a year or a fishing season. Setting and achieving a TAC that is set within prescribed sustainability limits is at the heart of any quota management system. The requirement to set the TAC to produce a yield at or above Maximum Sustainable Yield (MSY), albeit subject to a number of other considerations, was incorporated into the Fisheries Act 1983 and became the theoretical basis of initial catch limits set when fisheries were introduced to the QMS in 1986.

In the lead up to 1986, the status of fisheries could be loosely categorized into two groups: deepwater/mid-depth fisheries, which were under rapid development, and the inshore fisheries, which were largely in an already overfished state. Consequently, managers and scientists were faced with the challenge of setting, on the one hand, TACs in fisheries where the biomass was being fished down to an MSY level from a virgin state and, on the other hand, setting TACs at levels that would allow biomass of overfished stocks to recover.

### Total Allowable Catch Setting in Deepwater/Mid-depth Fisheries

At the inception of the QMS, insufficient data were available for stock assessments of most deepwater/mid-depth stocks (Sissenwine & Mace, 1992). Initial TACs were set largely on landings recorded in the prior year or were based on a stock productivity of between 5 and 15% of surveyed biomass (where available). Catches in New Zealand's largest fishery, hoki, were expanding rapidly, and a biomass estimate available from acoustic surveys at the time of introduction suggested that further expansion was possible (Johnson & Haworth, 2004). Reflecting this optimism, initial TACs were set at 250,000 mt, which was less than the 15% stock productivity value. In practice, industry catch was well below the TAC limits over the first five or so years of QMS management. It was not

until 2004, following a long period of poor natural recruitment, that biomass levels were fished down to near-Maximum Sustainable Yield levels. Since then, as a result of conservative catch limits, the biomass of the fishery has rebuilt to again be considerably above the level that would support MSY.

### Total Allowable Catch Setting for Inshore Fisheries

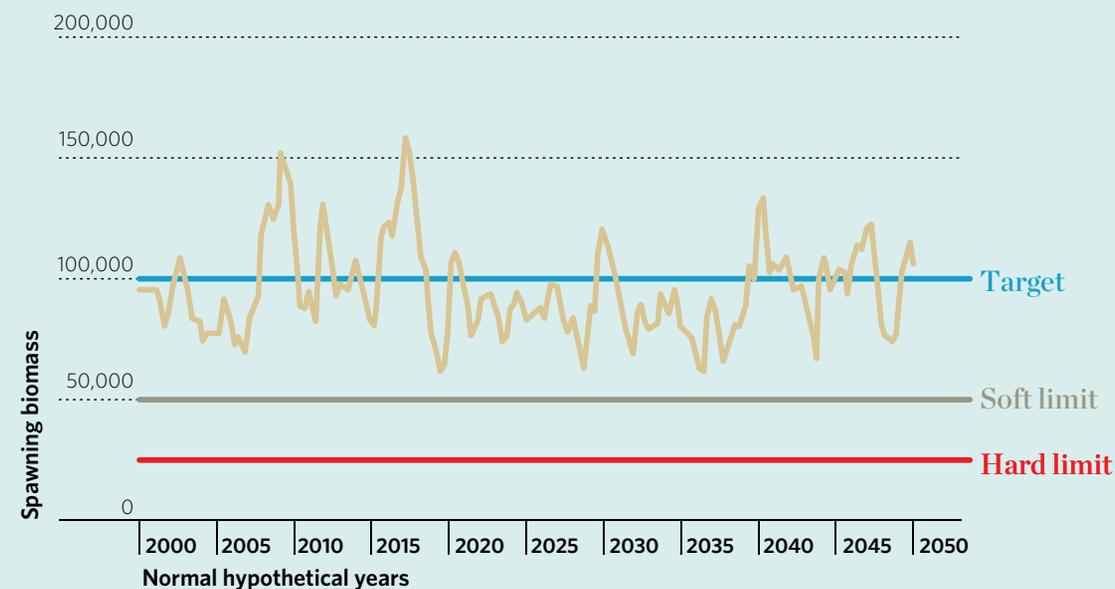
The initial TAC setting for inshore stocks faced a different challenge. In addition to the lack of research information needed for stock assessments, quota allocations in almost all of the initial 21 inshore species introduced into the QMS exceeded historical reported landings, some by a considerable margin as a result of the process used to assign quota allocations described above (Sissenwine & Mace, 1992; Lock & Leslie, 2007). For example, for the snapper fishery, which accounted for 50% of inshore catch, TACs were initially set to encompass the additional quota allocated and were then cut back, first through a buyback of quota and then through pro-rata reductions that took several years to effect. Since the shift to proportional quota in 1990, the major challenge for TAC setting for inshore fisheries has been the paucity of research, which would enable regular stock assessments and rebuild plans for overfished species. Given the realities of resource constraints, the Ministry uses a risk-based approach to set research priorities. As a result, many of the smaller, less valuable inshore stocks have remained unassessed for many years (see also Section 6a).

### The Introduction of the Total Allowable Commercial Catch

The Total Allowable Commercial Catch (TACC) was introduced in 1990. In setting a TACC, the Minister was to have regard to the original TAC set and was to allow for "Māori, traditional, recreational, and other non-commercial interests

in the fishery" (Fisheries Amendment Act 1990, no.29). Importantly, the additional provisions to the law introduced an explicit distinction between commercial and other fishing activities, making the level of commercial harvest subject to consideration of these other activities. An explicit allocation for commercial use under a TAC became required, whereas recreational fishing was left under open access subject to a range of bag limits and other regulations. Customary fishing was, for the time being, left in limbo pending the development of explicit laws allowing appointed Māori to issue authorisations to take fish for customary purposes. At this point, many customary fishers continued operating under the recreational rules. The government has interpreted the legislative requirement for TACC setting to mean that an allowance equal to estimated recreational catch and customary catch (as well as other mortality caused by fishing) should be deducted from the TAC before a TACC is set.

FIGURE 5. Harvest Strategy Standards applied to a hypothetical fishery



**Harvest Strategy Standards:** In an effort to clarify how the government intended to undertake its TAC setting obligations, the Ministry of Fisheries (now Ministry for Primary Industries, or MPI), produced a Harvest Strategy Standard and associated operational guidelines in 2008. The Harvest Strategy Standard (Ministry of Fisheries, 2008) consists of three core elements:

- A specified management target (usually a biomass level) around which a fishery or stock should fluctuate.
- A soft limit that triggers a requirement for a formal, time-constrained rebuilding plan.
- A hard limit below which fisheries should be considered for closure.

These concepts are illustrated in Figure 5. TAC levels are set within a target range. If the “soft limit” of biomass is reached, then the management response should be to implement a formal, time-bound rebuilding plan with TACs reduced accordingly. If a stock reaches a “hard limit,” then consideration should be given to closing the fishery to allow a rebuild. The Ministry reports annually on the status of QMS stocks against this standard, where it is known (MPI, 2016d).

### The Role of Research and Stock Assessments in Setting the Total Allowable Catch

Sufficient knowledge about the biology and status of stocks to be managed is critical to fisheries management. Recognizing this fact, along with the reality of resource constraints, processes and systems have developed over time to prioritize, execute, and incorporate research results into the fisheries management process over the 30-year QMS history.

In the early days of the QMS, the core fisheries management process involved a series of sequential steps which occurred annually. These steps included an open planning process which prioritised research across different fisheries, contracting out the research to research providers (usually via tender), research providers reporting back to

Fisheries Assessment Working Groups, and consolidating the information into an annual plenary fisheries assessment report on the scientific status of all QMS stocks. Where the information raised issues requiring a regulatory management response, such as changing TAC and/or TACC levels, advice was provided to the Minister on options which could be taken and finalised after a public submission period. This process is still largely followed, but with the absence of a formalised research planning process.

Fisheries Assessment Working Groups meet throughout the year. While their meetings are open to all stakeholders, they are primarily attended by scientists from industry and the Ministry for Primary Industries (MPI). In these meetings, MPI and participants evaluate presentations made by contracted research providers that might include the results

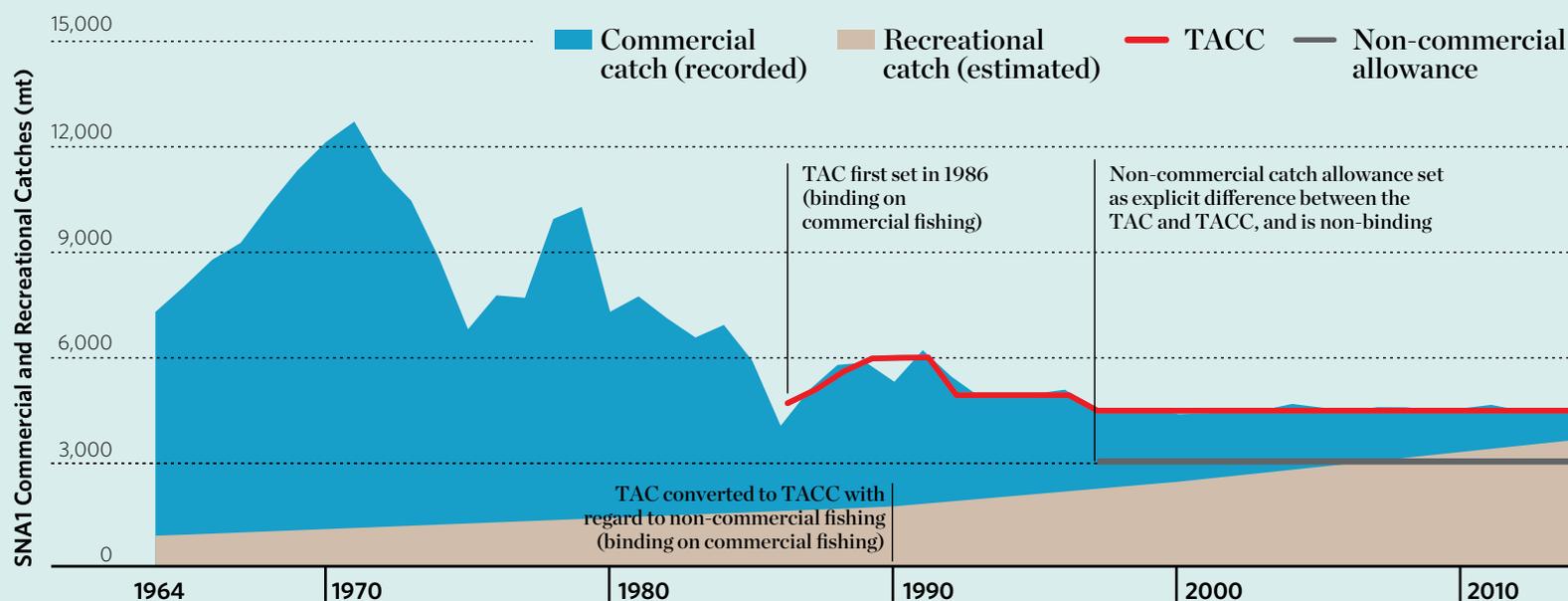
## Availability of Scientific Information for Stock Assessment

The level of available scientific information and the frequency of stock assessment varies considerably between stocks, with larger and more economically valuable stocks generally attracting more investment and management attention. For example, for hoki, which is the most valuable commercial finfish species in New Zealand (with total catches of around 136,000 mt), a stock assessment is undertaken each year. For the last assessment undertaken in 2017 against a target of 35-50% of  $B_0$ , the eastern hoki stock was assessed at 60% of  $B_0$  and the western hoki stock was assessed at 59% of  $B_0$ . This can be compared to snapper, which is one of the most commercially important inshore finfish species but has much lower harvest volumes (around 6,400 mt). The largest stock (SNA1), with a TACC of 4,500 mt, was last assessed in 2013 at 19-24% of virgin biomass (against a target of 40%); the next largest (SNA8), with a TACC of 1300 mt, was last assessed in 2005 at around 10% of virgin biomass; and the third largest (SNA2), with a TACC of 315 mt, was last assessed in 2010 with no conclusion able to be reached on stock status. Some valuable species, such as arrow squid, remain largely unassessed due to scientific difficulties. Arrow squid live for only one year, spawning once before dying. This effectively means that there is a new stock each year, so the biomass cannot be reliably predicted from historical data.

of scientific research, catch and effort reports from commercial fisheries, data from the New Zealand on-board observer programme, and other information. Some Working Groups also discuss possible research, but, as noted above, there is no longer a formal process to develop research plans. Due to resource constraints, only a small proportion of the QMS stocks are able to be formally assessed in any one year. The available information on all stocks is summarised in two [Fisheries Assessment Plenary Reports](#), which are updated every year and are available on-line and in hardcopy upon request.

According to MPI scientists, 77% of the 348 stocks that were being managed in 2014 had been in the QMS for between 10 and 27 years. Yet the TACs for 57% had never been altered and there had been two or less changes for 89% of stocks. Only 16 of 348 stocks had experienced 5 or more changes in TAC. "The main reasons for this is the paucity of research and assessment information to inform quota changes, particularly for small stocks. Therefore, implicit constant catch scenarios are the norm and the legacy of the initial design of the system prevails" (Mace et al., 2013).

**FIGURE 6.** Historical change in the Total Allowable Catch setting process is shown against the backdrop of catches recorded in a key inshore snapper fishery, SNA1, by the commercial sector and as estimated for recreational fishing



Source: MPI 2017, Stock Assessment Plenary Report, Snapper (SNA)

## Allocating Catch in Shared Fisheries

In setting the TACC, the Ministry must first consider allowances for non-commercial fishing, such as recreational and customary, as well as other mortality caused by fishing. This amount is then deducted from the TAC. Some of the species commonly taken by recreational fisheries are shown in Table 2, which also compares the total recreational and commercial catches of those species for 2011-12.

For some fish stocks, the estimated recreational catch (and therefore allowance) exceeds or is near equal to the commercial catch. The recreational catches of kingfish and scallops exceed commercial catches, while the recreational catches of snapper and kahawai are near equal to commercial catches. As a consequence, increased recreational catch in some key inshore fisheries has resulted in TACC reductions and/or in changes in the proportion of an increased TAC (due to a stock rebuild) that is allocated to recreational fishers. For example, in New Zealand's largest snapper fishery (SNA1), an increasing proportion of the TAC has been allocated, over time, towards non-commercial catch. Figure 6 shows this change based on reported commercial landings and modelled recreational catch. (Modelled data are used because accurate data on the recreational catch are not available.) Using the modelled data, the Snapper fishery (SNA1) recreational catch is projected to be an ever-increasing proportion of total catch. While actual recreational catch can vary widely from year to year based on a range of factors, it is likely to increase as stocks rebuild. Readjustments to the TACC in the future could result in a further increase to the non-commercial catch share of the TAC if recreational catch continues to expand and the Minister approves higher allowance for the sector.

Stock rebuilding plans in shared fisheries are frequently a source of conflict between sectors because commercial and recreational fishers often have different objectives for stock composition and biomass levels (with recreational fishers seeking higher levels of abundance and larger "trophy" fish) and because the same Maximum Sustainable Yield can be

realized with different stock biomass. For example, in New Zealand's largest snapper fishery (SNA1), the catch reductions wanted by recreational fishers to increase abundance (i.e. biomass) could potentially come at a substantial cost to commercial fishers because they would reduce TACC without necessarily providing any long-term net economic benefit (since future increases in TAC could be allocated to the recreational sector). The law specifically exempts the Crown from having to pay compensation for TACC reductions implemented where catch reductions are made to ensure sustainability so there are no explicit financial costs to Government for reallocation (Fisheries Act 1996, Section 308(2)).

**TABLE 2.** Comparison of Recreational and Commercial Catches in Important Shared Fisheries, 2011-12

Species	Recreational catch (mt)	Commercial catch (mt)
Snapper	4,812	6,548
Kahawai	1,785	2,326
Blue cod	333	2,216
Red gurnard	203	3,351
Tarakihi	239	5,347
Trevally	209	3,132
Sea perch	78	1,108
Groper	219	1,506
Kingfish	662	235
Flatfish	59	2,865
Rock lobster	186	2,752
Paua	149	947
Scallops	185	113

*As cited in Bess 2017. Source: National Panel Survey*

## Section 2c: Fishing Under the Quota Management System

The basic elements of the QMS are described in Section 2a. Today, one does not need to own quota to fish commercially in New Zealand under the QMS. Rather, one needs a fishing permit and sufficient Annual Catch Entitlement (ACE) to cover the fish that are caught. This is an evolution of the QMS system since its original design. In addition, all fishers

must adhere to government regulations that apply to the fishery in which they are participating. The previous section described the key components. Below, we describe some of the aspects of the QMS that directly affect how fishers fish.

**The purpose of a catch-balancing system is to provide a mechanism to reconcile catch taken with TACC limits and to monitor catch of all QMS species whether a fish is targeted or not.**

### Balancing Catch

The purpose of a catch-balancing system is to provide a mechanism to reconcile catch taken with TACC limits and to monitor catch of all QMS species whether a fish is targeted or not.

Under today's QMS, Annual Catch Entitlement (ACE) is the catch right; it gives the fishing permit holder the right to take a certain weight of fish stock during a fishing year. The amount of ACE allocated in any year is equal to the TACC. Under the QMS, commercial fishing permit holders must balance their catch against ACE holdings or pay a deemed value (or civil penalty). If permit holders do not hold ACE, they may purchase ACE from another ACE holder in order to balance their catch. It is not uncommon for quota shares to be held by entities that do not intend to fish; rather, they use the quota share as an asset to generate revenue by selling the ACE generated from the quota shares to fishers who need ACE to balance their catch.

The catch-balancing system of the QMS was radically revised with the passage of the Fisheries Act 1996, mostly to overcome the complexities of running a system that required catch allocation to be held before fishing commenced. One of the constraints of the initial catch-balancing system was the technological requirements that required accounting for catch in a complex way (see box below for more detail on New Zealand's initial catch-balancing system).

As the implementation of the initial QMS was progressing and fishers constrained in QMS fisheries moved their efforts into non-QMS stocks, the largely open-access system of management that applied to non-QMS stocks was becoming unstable.

### The Original Catch-Balancing System of the Quota Management System (1986)

The balancing of catch under the initial QMS was complicated because commercial fishers were required to secure quota, either owned or leased, before they went fishing. Catches had to be balanced against these quota holdings on a monthly basis. For QMS fisheries, it was illegal to discard unwanted target fish, such as those that were too small or were uneconomical, unless allowed for by regulation (e.g. size limits). Fishers at the time, particularly in the inshore sector, described themselves as contingent criminals because they found it very difficult to predict the catch mixes that would be fished, particularly as their quota holdings were progressively used up during the fishing season. The only saving grace was that the number of species under QMS management was relatively low, and species not introduced into the QMS could be taken and discarded legally if taken either purposefully or as by-catch (referred to as non-QMS catch) while QMS fishing. Because only 26 of the around 130 species fished commercially were introduced into the QMS in 1986, much by-catch fell into the definition of non-QMS catch. Under this system, quota and lease ownership had to be tracked across multiple levels of ownership and across time. This required considerable computing power at a time when technological capacity for processing was dramatically less than what it is today. At the time, this technological challenge greatly limited the expansion capacity of the QMS and constrained the introduction of additional species into it. Such computing technology constraints are no longer a limitation.

In an effort to stop this expansion into non-QMS species, the Ministry introduced a number of regulatory measures within a relatively short period of time. The taking of non-QMS fish while fishing for a QMS species, however, continued to be seen as “an inevitable consequence of lawful fishing” and was largely allowed as policy discussions about the future of the QMS progressed (Ministry of Agriculture and Fisheries [MAF], 1990).

**A deemed value is essentially a balancing bond that can be redeemed if ACE is obtained by the end of the fishing year. Otherwise it is forfeited.**

Today, the QMS requires that catch be balanced against ACE on a monthly basis after fishing has occurred. If a fisher cannot balance the catch at month's end, he/she is required to pay a “deemed value” to the government. Because deemed values are set at varying levels depending on a range of factors and are frequently set above market ACE prices, they provide an incentive for fishers to buy additional ACE to balance their catch. Deemed values are the price payable by a commercial fisher per kilogram of QMS fish for which they do not have ACE value. A deemed value is essentially a balancing bond that can be redeemed if ACE is obtained by the end of the fishing year. Otherwise it is forfeited.

For targeted fisheries with substantial by-catch and for multi-species fisheries, obtaining the required ACE is an important aspect of fishing. Many of the fisheries now under QMS management remain undeveloped and subject to low catch limits, so ACE for these species is not always available. At the same time, availability of ACE for fully utilized species such as snapper can also be low.

**Catch of Non-QMS Species:** Commercial fishers also target a number of non-QMS species. In 2016, 19,000 mt of non-QMS catch was recorded, of which about 50% was taken in the highly migratory skipjack and albacore tuna fisheries not yet introduced into the QMS. The remaining catch of non-QMS fish, approximately 10,000 mt, was either from one of the 26 fisheries (defined as species or species complexes) still subject

to the permit moratorium introduced in 1993, which aimed at limiting their development before being considered for QMS management, or were non-QMS species not on the moratorium list that could therefore be taken or discarded. The Minister is obliged to consider these non-QMS species for introduction (or other management) if a future risk to their utilisation or sustainability arises.

Overall, compared to the catch-balancing system adopted in 1986, the current system is far more efficient. There is no need for complex tracking systems because ACE is traded separately from quota share ownership. The current system also places far more accountability on commercial fishers for both reporting and balancing catch, and a far greater number of species and stocks are subject to control. The consequence to fishers of the new balancing system is that they are confronted with increased economic costs when ACE cannot be obtained to cover catch. The drivers of ACE availability (or lack thereof) are many. If a Total Allowable Catch/Total Allowable Commercial Catch is set too low and does not reflect the actual abundance of a particular species, ACE availability can be constrained or deemed value rates can be set too high. This provides a financial incentive for fishers to misreport and/or discard catch. In addition, if the ACE that is for sale is offered in relatively large “packages,” it can be difficult for small-scale fishers to access the ACE they need (Stewart & Leaver, 2014, 2015). Overall, the challenges to balancing catch in the New Zealand QMS remain large given its comprehensive coverage, and responses to these challenges may drive further reforms.

## Discards

The fundamental rule is that all fish managed under the QMS must be landed and recorded, with the dumping of fish prohibited by law. The landing rule is not, however, comprehensive. For example, for multiple species, including fish from shared fisheries such as snapper and blue cod which have a minimum legal size for commercial fishers, undersized fish must be returned to the sea immediately, regardless of whether the fish

are dead or alive.<sup>3</sup> Illegally dumping quota fish is an offence and subject to a maximum fine of \$250,000 NZD (Heron, 2016).

The topic of how much discarding occurs under the QMS, as well as how effective the government's current monitoring, reporting, and enforcement actions are, has been the subject of much debate in New Zealand over the past several years (Simmons et al., 2016; Heron, 2016). The lack of availability and high cost of ACE and the "high-grading" of QMS species for quality or marketability are the two most frequently cited incentives for discarding. There have been multiple efforts to address this problem over the years, including a number of revisions to the deemed-value system. Current efforts are focused on the implementation of improved catch-monitoring systems, including a move towards a required Electronic Monitoring System for all of New Zealand's commercial fishing vessels.

## Monitoring and Reporting

Information on fisheries harvests in New Zealand is obtained from commercial fishers who are required to report their targeted and incidental catch and all landings of QMS and non-QMS species. This self-reporting is supplemented by at-sea observers, reconciled with separate records kept by licenced fish receivers, and, beginning in October 2017, an electronic reporting and monitoring system.

When the QMS was first being considered, there was much debate around the design of monitoring and enforcement systems to ensure that catch taken was accurately balanced against quota held. After considering the unique characteristics of the QMS, including the structure of the industry at the time and the potential for the QMS to generate incentives for self-enforcement, the option of real-time monitoring through comprehensive use of observers and dockside monitoring

<sup>3</sup> It is important to note that these rules are taken into account in the stock assessment process (i.e. TACCs are set taking into account other sources of mortality, including juvenile mortality associated with returning fish to the sea).

was rejected as being too costly (Nielander & Sullivan, 1999). Instead, an interrelated system of record keeping and reporting was established. It included Catch Landing Returns (CLRs),

## At-Sea Observers

New Zealand's observer programme was established at the time the QMS was introduced in order to help ensure "the collection of reliable catch and effort information for management purposes and increasing the accuracy of information concerning fish and fisheries for research purposes" (Fisheries Act 1983, 67(c)). Observers were appointed by the Director-General of the then Ministry of Fisheries, but were not deemed to be employees of the public service. Observers were specifically excluded from holding any fisheries officer's powers. Initially, observers were paid for by the Ministry, which was also required to pay the fishing vessel for the provision of food and accommodation.

With the introduction of cost recovery and the enactment of the Fisheries Act 1996, the responsibilities expected of observers were broadened, and costs for delivering observer services were required to be fully cost-recovered from the industry. While still not given the power of fisheries officers, observers were authorised by law to collect a wide range of information for fisheries research, management, and enforcement, as well as for safety, employment, and compliance with maritime rules. Observers were given explicit powers to access records, people, and operations while on board vessels so that they could collect such information.

Observer coverage in the inshore fleet is very low, which makes independent estimates of incidental catch by this fleet a challenge. For example, the snapper bottom long-line fishery had only 0.3% observer coverage in 2012-13, and there was no coverage during the 2010-11 or 2011-12 fishing years. The inshore and flatfish trawl fisheries, which together accounted for 60% of the total inshore trawl effort in New Zealand at the time, had, respectively, only 0.5% and 0.3% observer coverage for the 2012-13 fishing year (Abraham et al., 2016). It is important to note that because observer effort and coverage is objective, based and targeted at key seasons, geographies, and higher risk vessels, the coverage figures likely underestimate the observer program's effectiveness. Observer coverage has been much greater in the deepwater fleet, which has enabled more reliable estimates of by-catch to be undertaken since 1990-91. (See Section 6a for a discussion on the impacts of by-catch.)

Quota Management Reports (QMRs), and Licensed Fish Receiver Returns. At the commencement of the QMS in 1986, quota holders were responsible for furnishing QMRs each month to record catch against quota. Fish landed were then again reported by the Licensed Fish Receivers, who were also required to keep internal company records of fish product flow. With these monitoring and enforcement systems, New Zealand established a type of fish traceability system from the time that the QMS was first introduced.

Catch Landing Returns (CLRs), although not initially part of the formal documentary flow of the QMS, were later formalized as a means of recording what species were targeted, what main species were caught, when and by what method, and to which Licensed Fish Receivers fish were landed. CLRs not only provided an additional link in the document chain, but were also a valuable tool for scientists because they provided information about catch and fishing efforts over time for both QMS stocks and some non-QMS species. CLRs therefore became an imperfect vehicle for collecting information for three different purposes: management, science, and enforcement. However, the role of observers in independently recording such data proved to be a difficult balance between scientific work and monitoring for enforcement (see below).

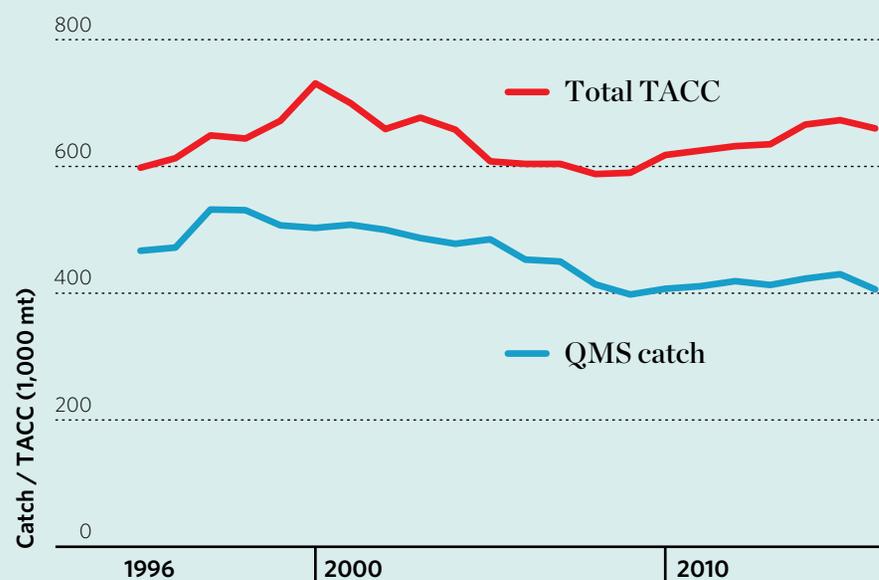
## Compliance and Enforcement

Throughout its 30-year history, compliance with the QMS has focused on three types of offences: fishing without authority, misreporting catch by species, time, location, and/or quantity (including discard of caught fish), and failure to balance catch against quota. Ensuring compliance with these elements of the QMS is aimed at ensuring that catch is reported accurately against harvest sustainability limits, most critically the TACC. In addition, fishers need to comply with all existing regulations, which have expanded considerably over time (McClurg & Arbuckle, 2009). In aggregate, Figure 7 shows that reported catch in all QMS fisheries is well below TACC limits, while catch against TACC varies at an individual stock level.

The QMS established penalty systems and the capacity of enforcement officers and the Crown to both detect and prosecute offences. Fisheries officers were provided with wide powers, including random entry, search, and questioning. Likewise, offences under the law were treated as strict liability offences (i.e. it is not necessary, in most cases, for the prosecution to prove that a defendant intended to commit an offence).

The government responded to enforcement challenges under the QMS by significantly restructuring, re-skilling, and replacing its capacity to enforce and prosecute fisheries offences. A new cadre of enforcement personnel was developed, encompassing surveillance officers working in the field

**FIGURE 7.** The total Quota Management System (QMS) catch and Total Allowable Commercial Catch (TACC), 1995 to 2016



Source: data provided by FishServe

and investigators supported by a team of forensic accountants. Most at-sea surveillance was carried out by the New Zealand Air Force and observers (see box on page 51). These structures and capacities were merged into the new Ministry of Fisheries in 1995.

During the first four or so years of the QMS a range of enforcement problems were identified. These included: the balancing of by-catch of QMS species as fishing patterns changed with the rationalization of the fleet; the tracking of quota ownership; the increasing ambiguity around who was entitled to fish on behalf of quota holders and what this meant for enforcement; evidence of misreporting related to the location of catches against QMA areas (i.e. trucking of fish was occurring); and the scale of penalties, which was thought to be too low to deter large scale fraud.

Responses to these problems were addressed in the Fisheries Amendment Act of 1990. New regulations included:

- The introduction of a range of defences allowing for the retrospective purchase of lease rights to cover “unintended” catch. This proved to be a forerunner to the balancing system introduced later with the Fisheries Act 1996.
- The introduction of the deemed-value system. This system, in particular, changed the penalty system applying to overcatch from being reliant on criminal law (i.e. prosecution, fines, and potential imprisonment) to being based on administrative law. Much like a traffic offence, deemed-value payments are charged for catches that are not balanced against ACE (at least as a first-level response).
- The tightening of legal arrangements defining who was allowed to take fish on behalf of quota holders as well as the increasing of penalties for serious offences.
- In 1994/95 a vessel-monitoring system was implemented in deepwater/mid-depth fisheries to better monitor vessel activity.

The Ministry of Fisheries increased its focus on the potential for serious offences with the establishment of a Serious Offences Unit and the initiation of a strategic review of its approach to fisheries compliance. This review, informed by international academic expertise (see, for example, Sutinen, 1994), recognized that compliance is generated by a range of factors such as moral obligation and social influence, rather than just the level of deterrence provided through enforcement. The Ministry of Fisheries adopted an overall objective aimed at achieving an “optimal level” of compliance, balancing investment in strengthening incentives and commitment to voluntary compliance with the use of deterrent tactics. Priorities were set through the establishment of strategic plans and the annual production of three-to-five-year rolling plans (Ministry of Fisheries, 1998). This approach has become known as the VADE (voluntary, assisted, directed and enforced compliance) approach and continues to this day. With the merger of the Ministry of Fisheries into MPI, the compliance programme has become integrated into primary sector-wide strategies (see for example the Ministry for Primary Industries Statement of Intent, 2012-2015).

## Electronic Monitoring and Reporting

In 2017, the Ministry for Primary Industries launched a comprehensive Integrated Electronic Monitoring and Reporting initiative for tracking, monitoring, and reporting of commercial fishing activity. It will include requirements for geospatial position reporting in order to identify where fishing is happening, electronic reporting through e-logbooks in order to obtain more accurate and up-to-date information about fishing activity, and electronic monitoring (cameras)

**The Ministry of Fisheries adopted an overall objective aimed at achieving an “optimal level” of compliance, balancing investment in strengthening incentives and commitment to voluntary compliance with the use of deterrent tactics.**

to verify what is being reported (MPI, 2016c). The new system is aimed at “obtaining better information for better management decisions and for giving confidence to New Zealanders, and consumers from around the world that New Zealand fish are being managed and caught sustainably. And where evidence of illegal activity is captured, that information can be used to prosecute.” The first two elements of *the new system*, geospatial position reporting and electronic reporting, are going to be rolled out beginning October 1, 2017. Electronic monitoring (cameras) will be phased in beginning October 1, 2018..

## Section 2d: Funding Fisheries Management

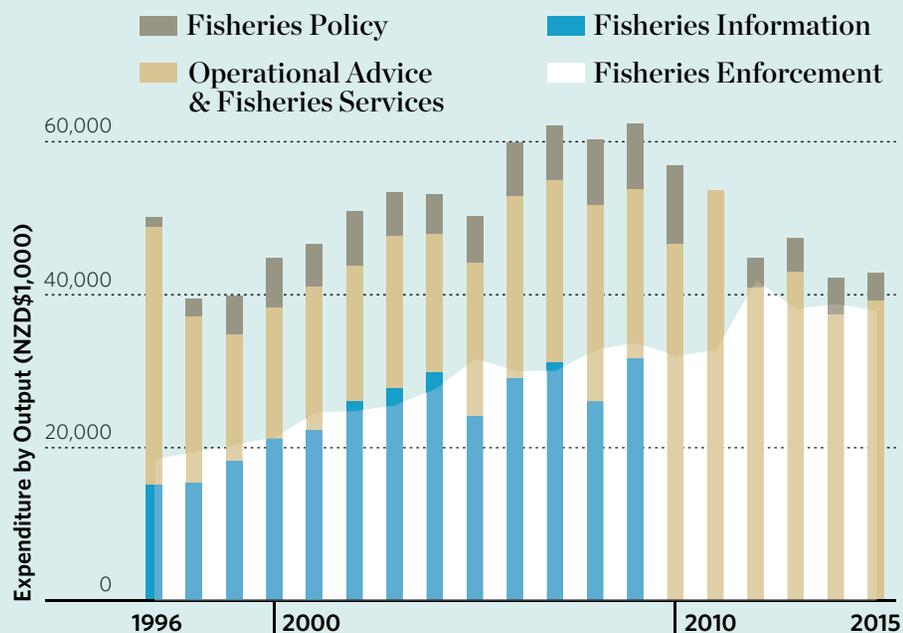
The Food and Agriculture Organization (2008) recognises four general approaches and combinations of approaches that have been adopted internationally for funding fisheries management: government funding through general taxation (and sometimes supplemented with direct taxes on fisheries), self-funding by resource users, partnership and collaborative arrangements between the state and private sector, and donor and multilateral agency assistance (FAO, 2008).

Most countries fund fisheries management as a public good from general taxation funds. New Zealand is unique in that it has adopted a comprehensive regime of direct taxation (called cost recovery) to fund commercial fisheries management costs, including enforcement costs. This regime has been accompanied by a high level of self-funding made feasible through the establishment of the QMS (defining beneficiaries of such investment) and supporting laws. The following analysis separately describes funding for fisheries management provided through government appropriations and activities funded by the seafood industry either through direct taxes on quota and catch (cost recovery) or self-funded “voluntary” activities.

### Government Funding for Fisheries Management

New Zealand has a Westminster-based system controlling government taxation and expenditure, the principles of which are outlined in the Constitution Act 1986 (introduced in the same year as the QMS). Under this Act, it is unlawful for the government to spend any money unless it is authorized by an Act of Parliament. Annual Appropriation Acts are the primary mechanism by which Parliament authorizes Ministers to incur expenditure through the administration arms of government, which are the Ministries and Departments.

**FIGURE 8.** Government expenditure for fisheries management by output category, 1997 to 2015



Source: Data collated from Annual Parliamentary Appropriations for Vote Fisheries

## Government funding for fisheries research has decreased considerably, in real terms, to around 50% of funding levels in the 1990s.

Expenditure by Ministers is governed under the Public Finance Act 1989 (PFA, 1989), which was introduced to improve government accountability to expenditure through an annual appropriations process. Appropriations are described in terms of “outputs” that will be delivered. “Outputs” are defined as “goods or services that are supplied” by a Government Ministry or Department, including services that are directly supplied by them and those that are contracted out by them to other entities. Expenditure is managed on an accrued basis, and budgets by output include all overhead costs. The principle behind the PFA 1989 is that that “outputs” delivered by a Ministry or Department will contribute to realizing the “outcomes” set by the Minister or government. In the case of fisheries, this includes the Minister’s legal obligations under the fisheries law.

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### Output Class Expenditures in Fisheries

Changes in how the government has organised fisheries over the history of the QMS have meant that “output” appropriation categories have changed over time due to realigning delivery structures within the various Ministries and changing Minister priorities. Output classes in fisheries were defined in some detail by the Ministry of Fisheries following its establishment as part of the cost process. They have

since been amalgamated and, to some extent, redefined by the Ministry for Primary Industries to better integrate with wider primary-sector activities. Nevertheless, they are close enough to provide a basis for historical comparison (see Figure 8). Although still funded through dedicated appropriations, fisheries services, such as enforcement, have been integrated into the general primary industry functions of “Policy and Trade” and “Regulatory Assurance.” Under this new structure, the Fisheries Enforcement and Monitoring expenditure has increased markedly relative to other fisheries services.

In comparison, policy, information, and regulatory advisory costs combined increased until 2010, peaking at around \$60 million NZD, but seem to have reduced since the stand-alone

Fisheries Ministry was merged back into the multipurpose Ministry for Primary Industries. Whether this is due to costs savings through merger cost efficiencies or reductions in services like research is not clear, as the amalgamation of output classes obscures such analysis. It should be noted that Figure 8 is presented in nominal dollars, and therefore does not take into account the impacts of inflation on reducing spending power over the 19 years of expenditure shown.

One aspect that is not shown by the graph, due to the amalgamation of data, is the specific government investment in fisheries science after 2009. MPI scientists have observed that government funding for fisheries research has decreased considerably, in real terms, to around 50% of funding levels in the 1990s. At the same time, the number of species and stocks in the QMS has increased 3.5-fold, and the need for research on recreational fisheries, the environmental effects of fishing, and an ever-increasing number of international fisheries research obligations has escalated from minimal to substantial (Mace et al., 2013).

## Industry Funding for Fisheries Management

Direct taxation (or cost recovery) was not a feature of the QMS in its initial design. Under the QMS as it was initially introduced, government recovered only limited costs of management through transaction charges on permits and licences as well as foreign access fees. Under the initial system, Government paid

### New Zealand’s Cost-Recovery System

Under the cost-recovery system introduced in 1999, the services for which the costs are fully or partially recovered are services that relate to i) monitoring and offence detection, ii) protected species research, iii) mitigation of the effects of commercial fishing on the environment or biological diversity, iv) monitoring of harvest levels, and v) administration and registry services. Costs incurred by government in providing these services are apportioned between the industry and the Crown according to a schedule which varies depending on the service.

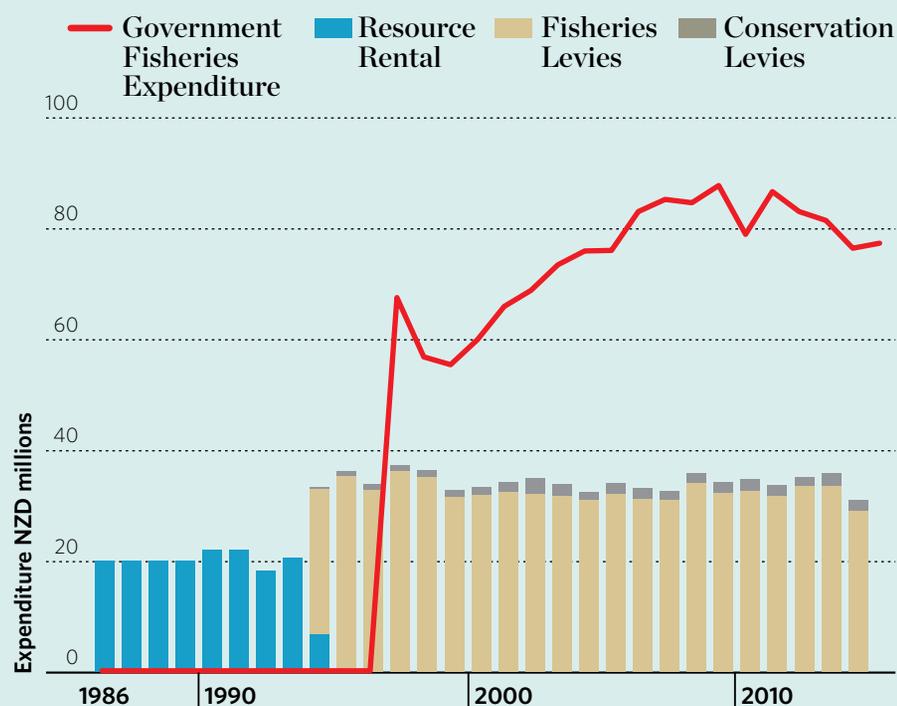
for management costs and collected an access fee in the form of resource rentals and sale of quota. As noted earlier in this report, this approach changed when the downside costs of TAC adjustments escalated and when the government moved to introduce proportional quota after the Māori challenged the notion of ownership. In 1994, these pressures resulted in resource rents being replaced with a regime that recovered a proportion of the costs of management. This change stimulated the seafood industry to engage in management aimed at reducing costs and/or increasing the value of services provided to support fisheries management.

## Cost-Recovered Services

The initial basis for cost recovery was informed by a Fisheries Task Force that promoted the idea that levies or charges in fisheries should “be employed where appropriate, to encourage fisheries users to seek out more effective ways in which government might obtain the services necessary to meet its responsibilities” (MAF, 1992). Under the initial cost-recovery programme, Government was able to recover most of the costs of fisheries management, enforcement, and research, as well as a range of conservation services, with only a relatively modest Crown contribution. This included industry paying 100% of the costs of deepwater research, 90% of the costs of inshore research, 75% of costs of managing conflicts between sectors, 87% of enforcement costs, and nearly 68% of all other fisheries management costs. This cost-recovery approach adopted an “avoidable cost” principle that “looked to recover all costs incurred by the Crown due to the existence of the commercial industry” (FAO, 2008). This general approach was modified significantly in 1999 through an amendment to the Fisheries Act, prohibiting the government from recovering costs of services devolved to and carried out by an approved service delivery agency.

The costs of particular services are allocated to particular stocks when the service is related to the stock, or across stocks based on a judgment as to which stock or stocks have caused the risk that the service is provided to manage. Costs are divided amongst the industry participants within a stock by a simple division by quota share ownership, or across stocks in proportion to the value of the fishery. For research costs, industry pays only the share of the TACC/TAC ratio. Not all research costs are recovered, however. For instance, much of the research on biodiversity is Crown funded. In addition, costs are not fixed levies. So, for example, if there is no research, then there is no cost recovery of that cost, which, in turn, might provide an incentive to do no research. A consequence of this approach, when applied to funding fisheries research and management, is that low value stocks (or depleted stocks) get less scientific and management attention because little funding is generated for them through the cost-recovery system.

**FIGURE 9.** Resource rents, cost-recovery levies, and total government fisheries expenditures, in nominal dollars



Data provided by the Deepwater Group, Ltd.

Cost-recovery levies do not include costs associated with devolved services. Devolved services are services that the Crown has determined it does not need to be responsible for and has authorised an Approved Service Delivery Organisation (ASDO) to provide to industry. The associated costs are exempt from cost recovery and charged directly to industry. Total annual costs recovered from industry relative to fisheries expenditure are shown in Figure 9.

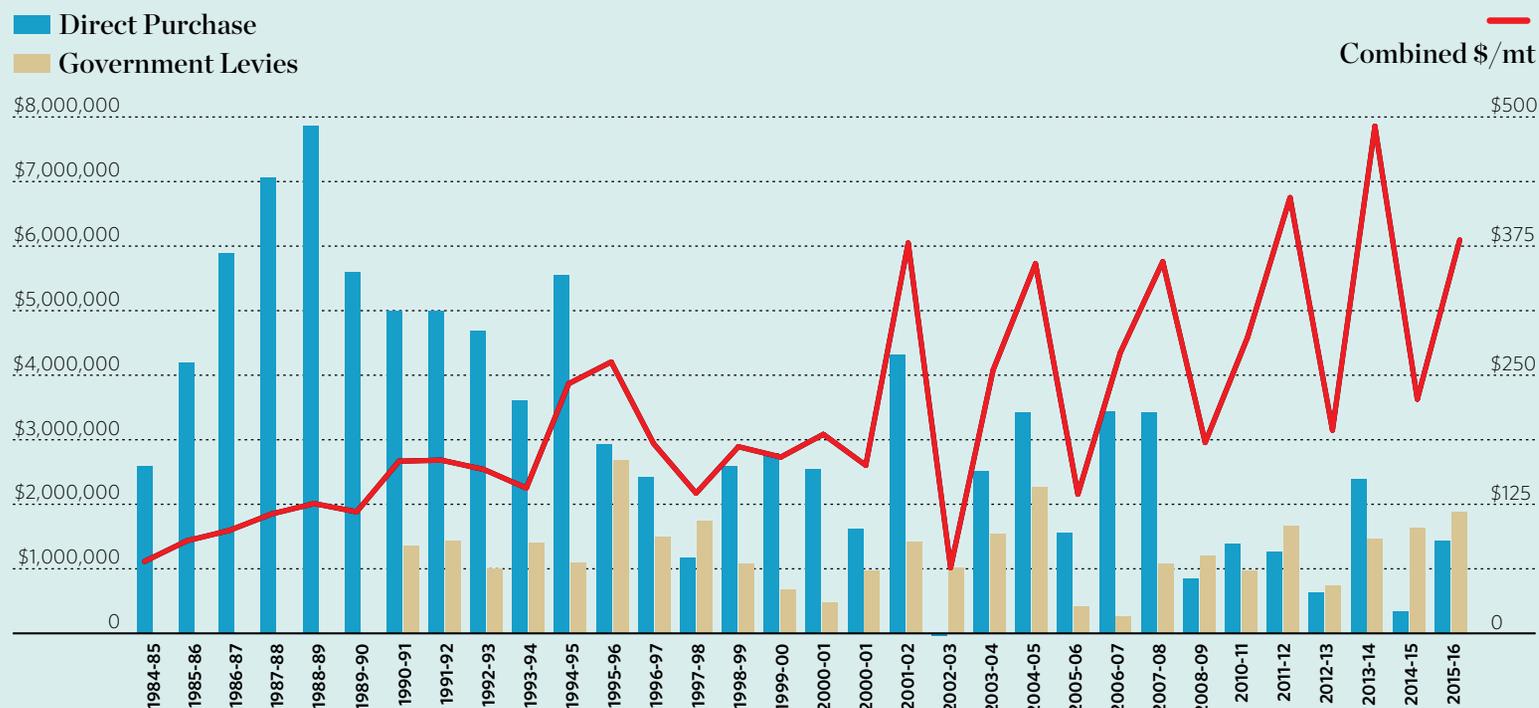
### Industry Self-Funded Services

In 2002, the industry formed and self-funded FishServe to provide a range of services previously provided by government around a quota registry, Annual Catch Entitlement, and catch balancing (See Section 4 for more detail). Therefore, cost recovery for those particular services ended in 2002.

Direct purchase of research outside the cost-recovery system has also increased over time. Although consolidated figures of direct purchase costs for fisheries research by the private sector were not available for this report, some examples demonstrate this increased private-sector expenditure (see Figure 10 on orange roughly expenditure). Industry has also directly funded research activities in multiple other fisheries, pursuing a variety of objectives. For example, the Rock Lobster council has funded research aimed at stock sustainability, and inshore fisheries quota owners have funded multiple other projects. See, for example, the [New Zealand Rock Lobster Industry Council budget and business plans 2013 to 2016](#) and the Fisheries Inshore New Zealand business plan 2015/16 ([www.inshore.co.nz](http://www.inshore.co.nz)). Industry has also funded research in support of new commercial fisheries such as seaweed.

**FIGURE 10.**

Orange roughly industry-funded research expenditure shown in \$NZD and as a cost per metric ton of fish harvested



Source: Data provided by the Deepwater Group Ltd

# The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights

*Carving at a marae  
(Māori meeting  
ground)*

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## SECTION 3

# The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights



Currently, the indigenous people of New Zealand, the Māori, represent about 15% of the country's population of 723,400 people (MacPherson, 2017). The Māori are organized around three main social groups: the whānau, which is a grouping of related iwi families; the hapū, a collection of whānau; and iwi made up of sub-tribal hapū. There are 58 recognised iwi in the Māori Fisheries Act 2004 (see Schedule 3). Individual Māori are often affiliated with multiple tribal groups, or iwi. Iwi are distributed across New Zealand and are bounded by distinct geographies, with most iwi and Māori located in the North Island by number and population. Only nine iwi are located in the South Island (including Stewart Island), which encompasses over 50% of New Zealand's land area and coastline.

Before European settlement began in New Zealand, the Māori were the only inhabitants of the country and exercised exclusive guardianship, ownership, and use of its vast fisheries resources.

Seafood, known as kaimoana (or food “kai” of the sea “moana”), was an integral component of the Māori diet. It was also traded freely between tribes. Most fishing was carried out at the whānau or hapū level, although some large expeditions were also undertaken by iwi. The Māori fished individually using small canoes, while using larger canoes when fishing at the hapū level. Hapū controlled access to main fishing grounds, although rights to local fisheries were also held by whānau. Customary Māori use of sea fisheries was a core aspect of Māori life and livelihoods and included recreational, ceremonial, and commercial use.

Between Captain Cook's first exploratory journey to New Zealand in 1769 and the signing of the Treaty of Waitangi in 1840, there was a growing influx of European whalers, traders, missionaries, and settlers arriving in New Zealand. This growing population threatened Māori authority and sovereignty, driving the Māori to negotiate with the British Empire to establish

a framework for the future governance of New Zealand. The resulting Treaty of Waitangi would become the fundamental basis for the reassertion of Māori ownership rights and their use of New Zealand's rich natural resources, including fisheries.

In 1840, over 500 Māori representatives signed 9 different versions of the Treaty of Waitangi alongside representatives of the British Crown. The Treaty detailed a partnership between the Māori and the Crown, granting the Crown governance

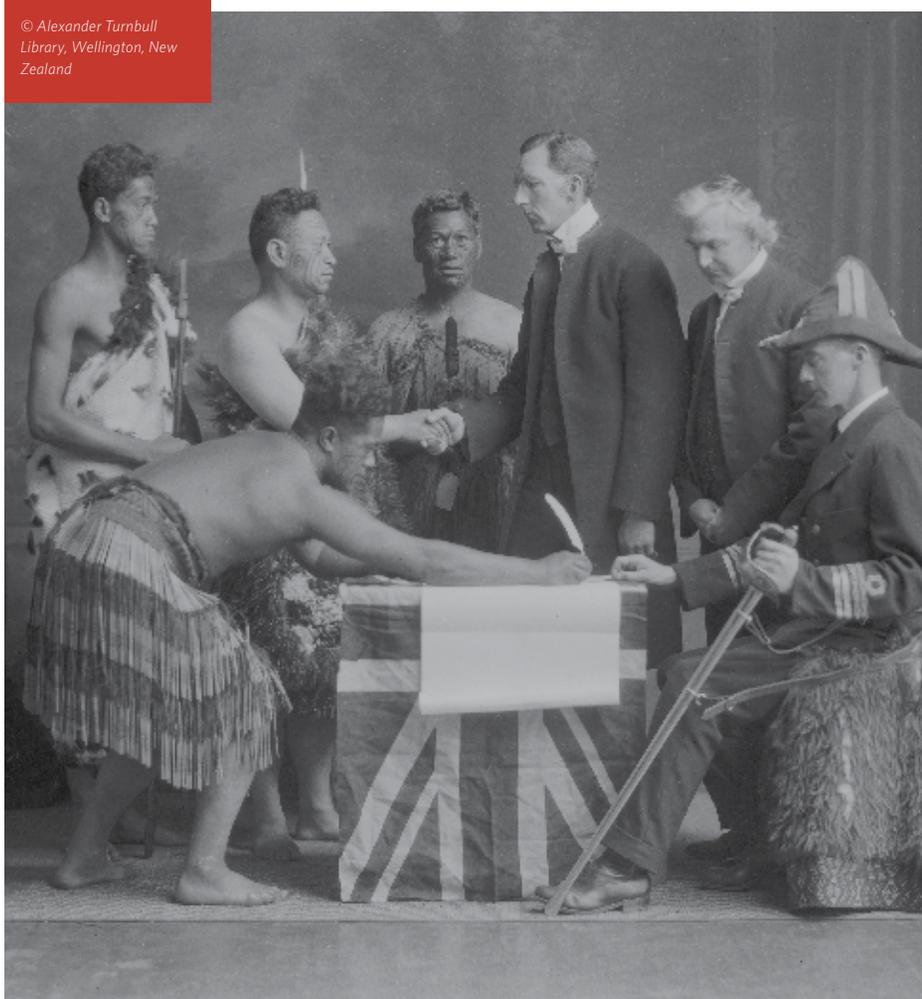
rights in New Zealand while also guaranteeing "... to the Chiefs and Tribes of New Zealand and the respective families and individuals thereof the full exclusive and undisturbed possession of their lands and estates Forests Fisheries and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession" (Treaty of Waitangi, 1840a).

The involvement of the Māori in fisheries after the signing of the Treaty of Waitangi is a story about the struggle to have indigenous rights over fisheries recognized and secured by the government of New Zealand, known in constitutional terms as the Crown. This chapter briefly chronicles the progress the Māori have made in reasserting these rights and interests in fisheries and how this was facilitated through the introduction of the Quota Management System.

The Māori struggle to gain recognition of their fisheries rights in New Zealand before and after the establishment of the QMS in 1986 unfolds over five key historical periods following European settlement. Each of these periods signal important lessons for the development of rights-based systems for fisheries elsewhere. The first period lasted over 140 years, from the signing of the Treaty of Waitangi in 1840 through to the introduction of the QMS in 1986. During this period, Māori rights in fisheries languished because they were not accorded meaningful legal recognition even though they were guaranteed under the Treaty. They were not, however, explicitly extinguished by legislation, either; they continued to be referred to in statutory provisions. What followed from 1986 until the present day is a 30-year transition period. Pivotal events in the history of Māori fisheries are described in the timeline in Table 3.

Tableau, re-enacting the signing of the Treaty of Waitangi, at the East and West Missionary Exhibition, Wellington Town Hall

© Alexander Turnbull Library, Wellington, New Zealand



**The involvement of the Māori in fisheries after the signing of the Treaty of Waitangi is a story about the struggle to have indigenous rights over fisheries recognized and secured by the government of New Zealand, known in constitutional terms as the Crown.**

## Dispossession of Indigenous Fisheries rights

The Treaty of Waitangi established a partnership between the British people, represented by the British “Crown,” and the Māori people. British governance was offered in exchange for the continued recognition of Māori sovereignty, use, and undisputed possession of lands, estates, forests, and fisheries owned collectively or individually. Some 544 Māori signed the treaty on behalf of various tribal and family groups, establishing a wide, although not necessarily comprehensive, accord.

The Crown first legislated on fisheries resources with the Oyster Fisheries Act 1866, seizing control of traditional Māori oyster beds in response to apparent overfishing. Further scarcities in fisheries resources led the Crown to vest in itself New Zealand's fisheries under the Fish Protection Act 1877. While Māori interests were acknowledged under this law, Māori rights guaranteed under the Treaty of Waitangi had no practical expression. This was the first instance in an ongoing pattern of empty statutory provisions, and the New Zealand courts went so far as to pronounce the treaty a “simple nullity” in law (*Wi Parata v. Bishop of Wellington*, 1877).

The Crown failed to honour its responsibility to recognize the Māori in fisheries ownership for over 140 years. In practice, the government continued to assert a “right of the commons” to fish below the high-water mark. The principle of perpetual, free access to fisheries resources was founded in the British common law system. The British Government failed to recognize or acknowledge that the Māori had a different conception of property-in-the-sea. The systematic and significant loss of Māori land adjacent to coastal areas also effectively undermined Māori opportunities to utilize their sovereign rights to access fisheries resources and to exercise their harvesting capabilities. Where

**The Crown failed to honour its responsibility to recognize the Māori in fisheries ownership for over 140 years.**

**TABLE 3.** Important Historical Periods in the History of Māori Fisheries

Historical period	Period / Date	Key events explanation
European Settlement	1769	Captain Cook first landed in New Zealand.
	1769 - 1840	Period of increasing European settlement and conflict with the Māori.
Dispossession of Māori rights in fisheries (Māori excluded from fishing)	1840	Signing of the Treaty of Waitangi ceding sovereignty to the British Crown but guaranteeing Māori rights in Fisheries.
	1840 - 1982	Access to fisheries was largely unconstrained under the British legal tradition of common ownership.
	1982	Part-time fishers were removed from fishing, including many Māori involved in customary fishing (which included trade and sale of fish).
Recognition of Treaty rights in fisheries	1986	The QMS was introduced, allocating harvest rights based on recent catch history but not part-time fisher catch history.
	1987	Māori succeed in gaining a Court injunction against further allocation of ITQ rights.
	1987 - 92	Negotiations between the Crown and Māori are carried out to settle indigenous claims to fisheries, including an interim settlement established in 1989.
Development of formula for distribution of Settlement Assets	1992	A Deed of Settlement is finally agreed, providing full and final settlement of all Māori claims to fisheries encompassing a 50% share of New Zealand's largest seafood company, Sealord Products Ltd. Separate provision was made for commercial and customary fishing rights.
	1992 - 2004	The Māori develop a formula for the distribution of Settlement Assets.
Distribution and management of assets by MIOs	2004	An allocation formula was agreed, involving allocation of quota and shares to Mandated Iwi Organisations (MIOs) based partly on coastline length and partly on population.
	2004 - 2014	Transfer of assets to iwi, subject to meeting mandate and governance thresholds.
	2014 - 2017	Restructuring of Māori peak bodies to represent MIOs.

customary fishing rights were incorporated into law, protection was sporadic and covered private customary rights to harvest rather than catch for commercial use.

Successive regulations restricting use and access to fisheries were passed with no consultation with the Māori, who persistently voiced protests against restrictive legislation. In 1914, the Court of Appeal confirmed the earlier position that the Treaty of Waitangi conferred no legal rights except by enactment in statute (*Waipapakura v. Hempton*, 1914). Māori proprietary rights in fisheries therefore had no meaningful formal recognition between 1840 and 1987, despite their purported protection under the treaty.

*Te Kaha locals prepare fish for a hāngī (earth oven)*

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### Section 3:

The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights

However, as Māori representatives became more integrated into the government, continued protests against the expropriation of Māori lands and resources eventually gained enough political momentum that the Waitangi Tribunal was created in 1975 as an advisory body to the Crown. According to the Waitangi Act 1975, the Tribunal was empowered to investigate current claims and breaches of the treaty. Though it had no power to settle historical claims, it made headway in establishing facts regarding the nature of historic Māori fisheries and dispossession events (Bargh, 2016).

Yet the British legal concept of “right of the commons” continued to result in overfishing, as commercial fishing capacity in inshore fisheries expanded rapidly in the 1970s. In response, a new Fisheries Act was passed in 1983 to govern and manage fisheries use. The Fisheries Act 1983 anticipated the establishment of government-developed fisheries management plans, which were underpinned by regulations to manage common access to fisheries.

## Exclusion of the Māori from Fishing

In 1983, many Māori were predominantly part-time fishers. Although the new law continued to recognise Māori fishing rights in principle (it explicitly stated that “nothing in this Act shall affect any Māori fishing rights”), it lacked any practical substance (Fisheries Act 1983, s 88(2)). As described in Section 2a, government moved to limit commercial fishing pressure by introducing limited licensing in selected fisheries and establishing a moratorium on the number of “commercial fishermen” that were permitted to go fishing. This decision had the consequence of locking many Māori out of fisheries because the restrictive definition of “commercial fishermen” excluded part-timers, many of whom were customary Māori fishers. This heightened Māori tensions with the New Zealand Government. Although Māori fishers at the time were not explicitly exercising a traditional right, this decision had the consequence of locking many Māori out of fisheries because the restrictive definition of

“commercial fishermen” excluded part-timers, many of whom were customary Māori fishers. This heightened Māori tensions with the New Zealand Government.

It is therefore possible to conclude that there was little to no recognition of Māori ownership in fisheries from the signing of the Treaty of Waitangi through to the mid-1980s. The introduction of the British legal system, with no incorporation of Māori legal conceptions of property-in-the-sea, and the continued government-centric management approach staged under the new Fisheries Act 1983 both acted against the recognition of indigenous rights in fisheries.

## Recognition of Indigenous Rights Under the Quota Management System

Politics in New Zealand changed dramatically in 1985 as the Lange Labour government came into power in a landslide snap election driven by a looming economic crisis. The Lange government introduced radical economic reform, but also, for the first time, created policy with the Treaty of Waitangi in mind. The Treaty of Waitangi Act 1985 gave the Waitangi Tribunal the power to hear historical claims. The Muriwhenua people, comprised of five tribes historically located in Northland, launched a claim over traditional fishing grounds in December, 1986 (Waitangi Tribunal, 1988). Enabled by a more receptive governing party, the New Zealand High Court ruled for the first time that Māori have a customary right to fish that must be recognized in regulatory decision-making (*Te Weehi v. Regional Fisheries Officer*, 1986). These events were catalysts for change.

In 1986, the government passed a Fisheries Amendment Act to enable the full introduction of the QMS, which would establish perpetual commercial harvesting rights in fisheries. Notably, Section 88(2) of the Fisheries Act 1983 already acknowledged the existence of Māori fishing rights guaranteed under the Treaty of Waitangi and provided that “nothing in this Act” would

affect such rights. Yet, with the introduction of the QMS, the only real (albeit weak) provision made to proactively recognise such rights was the introduction of an amendment to the Amateur Commercial Fishing Regulations. This amendment to the Fisheries (Amateur Fishing) Regulations 1986 specified that no regulations under the Act would affect the taking of fish by Māori for a “hui [meeting], tangi [funeral], or traditional non-commercial fishing use” (the latter being a concept that poorly represented Māori customary fishing practice).

Reflecting on the historic failures of the government to recognize Māori interests in fisheries, many Māori believed that the private allocation of fisheries under the QMS would mean the end of any prospect of historical redress. But with the new authority of the Waitangi Tribunal, there was an unprecedented political forum that could be used to raise the issue. At the time, the Waitangi Tribunal was close to concluding the Muriwhenua hearings and requested a stay on the allocation of quota until the inquiry was complete. This request was ignored by Government, so Muriwhenua and the New Zealand Māori Council applied to the High Court for an Interim Injunction to stop the application of the QMS to squid and jack mackerel in Northland (*New Zealand Māori Council & Te Runanga o Muriwhenua v. Att General*, 1987). The injunction was granted, creating sudden leverage for the Māori to negotiate a settlement. Ngāi Tahu initiated a similar claim for these species in the South Island (Waitangi Tribunal, 1992). This was a turning point in the struggle for Māori rights to fisheries resources to be recognized.

The release of the full Muriwhenua fishing report was damning, as it confirmed serious breaches of the Treaty of Waitangi. Then, when the Tribunal proposed a settlement in quota (Waitangi Tribunal, 1988), immediate and vocal opposition from the fishing industry hastened the creation of a Crown-Māori working party to address the issue. Almost 150 years after the Treaty of Waitangi was signed, 150 Māori representatives and members of Parliament met in 1989 to discuss Māori ownership in fisheries. Māori representatives present maintained that the entirety of New Zealand’s fishing

industry had been secured under the Treaty of Waitangi, but proposed an equal share in the management and control of fisheries moving forward (Bargh, 2016). This proposition would be implemented by a jointly controlled fisheries commission and include a 50% Māori share in inshore fisheries quota.

An interim settlement was reached: 10% of quota for the original 26 species introduced into the QMS would be allocated to the Māori, a \$10 million NZD cash settlement would be granted, and a corporation, Aotearoa Fisheries Limited (AFL), would be created to receive and manage the quota assets. A new Māori Fisheries Commission was also to be established to manage the settlement process. Half of the quota and cash settlement would be transferred to AFL to be managed on behalf of the Māori until a formula for the distribution of quota assets amongst iwi was agreed and implemented. As it took some time for the Crown to purchase quota to allocate to the Māori under this agreement, it paid the Māori in the interim with the annual lease value of the missing quota until it was purchased and allocated. The fishing rights provided to the Māori under the interim settlement became known as the Pre-Settlement Assets (PRESA). The Māori Fisheries Act 1989 formally incorporated this deal into law, becoming the first legislated recognition of Māori property rights in sea fisheries since 1840. The 1986 introduction of New Zealand's Quota Management System (QMS) represented a turning point in the recognition of Māori rights in New Zealand fisheries. It established a property rights framework that enabled Māori to mount a successful legal challenge and provided a system of management and use of fisheries that could give explicit and exclusive recognition of the Māori rights guaranteed under the Treaty of Waitangi.

The QMS, however, also entrenched the separation between customary fishing for trade and other types of customary fishing, such as for personal and ceremonial use. These had traditionally been one and the same thing. Provision for non-commercial customary use was only partially dealt with in the interim settlement through the enactment of powers to

### **Section 3:**

The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights

establish Taiapure, a type of local fishery-management advisory committee representing the local Māori people. Functionally, such committees were intended to be established over local fishery areas important to the Māori, but they were given no management authority beyond a mandate to recommend regulations to government. Taiapure were seen at the time as part of the "tool box" for fisheries planning (MAF, 1991).

In 1992 a hui-ā-tau, or annual Māori assembly, was convened with 400 representatives to discuss how decisions about allocating the PRESA assets amongst iwi should be made (Treaty of Waitangi Fisheries Commission, 1993). These representatives were, in part, worried that allocation would prejudice future court claims, but on the whole they made the decision that assets should be allocated as soon as possible. They gave commissioners the responsibility of developing an allocation formula.

Also in 1992, the Waitangi Tribunal's Ngāi Tahu Sea Fisheries Report was released, which found that Māori had a development right to fisheries that were not exploited by Māori prior to the Treaty. The findings of that report indicated that compensation provided by the interim settlement would be insufficient to fully settle claims to fisheries. At this time, New Zealand's largest fishing company, Sealord Products Ltd, unexpectedly came onto the market and was suddenly being promoted for sale to overseas interests. The interim settlement was due to expire, and the loss of such a large share of fisheries resources to overseas interests was seen as contrary to a comprehensive settlement of Māori interests. With this in mind, Māori vehemently objected to any sale that would compromise a fair settlement. Inspired by these events, and in an effort to progress a final settlement, the Government, supported by Māori Fisheries Commission appointees, renewed negotiations. These representatives proposed a new deal: Māori would be granted an increased share of quota assets and Māori and the Government would jointly fund the purchase of Sealord to be transferred to Māori as part of the settlement.

## The Deed of Settlement

In August 1992, agreement was reached between Māori negotiators and the Crown. The Crown would fund \$150 million NZD of the joint-venture purchase of Sealord Products Ltd, and the Māori Fisheries Commission would receive a 20% share of

quota of all fish brought into the QMS from that point onwards. In return, the Settlement would be “full and final”: the Waitangi Tribunal would no longer hear Māori fisheries claims and the Māori would endorse the QMS.

It is important to note that while the agreement was a “full and final” resolution of historical ownership claims, both parties agreed that joint-governance arrangements should be created to implement the deal. They also agreed that the Māori would be consulted in governance matters that might affect their interests. Phrased in terms of a “special relationship” between the Māori and the government, it was recognized that both this

relationship and the settlement itself built on the foundation established by the Treaty of Waitangi. Before the agreement could be implemented, it needed to be formally ratified by Māori. Crown representatives sought “sufficient consensus” among Māori for the deal. Ultimately, a Deed of Settlement was signed by a majority of Māori tribes and by the Crown’s representatives (Her Majesty the Queen and Māori Deed of Settlement, 1992).

## Customary Rights

The details of traditional and customary Māori use of fishing were not fleshed out in the Deed of Settlement, but specific provision was made for customary harvesting summarized in the preamble to the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992:

**While the agreement was a “full and final” resolution of historical ownership claims, both parties agreed that joint-governance arrangements should be created to implement the deal.**

Crown provision was made to “introduce legislation empowering the making of regulations recognising and providing for customary food gathering and the special relationship between tangata whenua [Māori holding customary authority] and places of importance for customary food gathering (including tauranga ika and mahinga mātaītai), to the extent that such food gathering is not commercial in any way nor involves commercial gain or trade.”

In 1993, the Ministry of Agriculture and Fisheries divided the Crown’s obligation to recognize customary fishing into two types of regulations. The first type were regulations providing for customary food gathering by tangata whenua, and the second type provided for the special relationship between Māori and places of importance for customary food gathering. The latter would encompass the declaration of Mātaitai Reserves, which were an important advancement for the Māori over the provision made in the 1989 interim settlement to establish Taiapure. Rather than just allowing a statutory committee of local Māori to make recommendations for the management of fisheries, Mātaitai Reserves would empower a Māori Committee to make bylaws over certain areas to control fishing. Regulations and bylaws applying to Mātaitai Reserves would overrule any Taiapure and any more general regulations that would otherwise apply to the area of the Taiapure (MAF, 1993).

In practice, the development of customary regulations applying to the geographic areas claimed by particular iwi has been slow and has more often than not proceeded on a functionally separate basis from iwi involved in the allocation and management of quotas and other commercial assets. This separation in large part reflects the traditional practice of Māori to carry out fishing activities at hapū (sub-tribe) or whānau (family group) level rather than at an iwi, or tribal, level where quota assets are now held and administered.

Regulations were passed in 1988 and 1998 setting out the rules that would apply to the Māori in exercising their customary rights to take fish. The regulations enable particular Māori individuals (Tangata Kaitiaki/Tiaki) to be appointed by any

of the whānau, hapū, or iwi having authority over a particular area to issue permits for the taking of fish for customary use. They also provide for the establishment of particular Mātaitai Reserve areas where Tangata Kaitiaki/Tiaki, appointed to administer the reserve, can make bylaws for that purpose. The consequence of this regulatory approach was to establish a framework for customary rights separate from the management of commercial rights (which was an iwi responsibility, see below) by enabling customary rights to be exercised at hapū and whānau level separate from iwi. Customary regulations were, moreover, developed and implemented before Mandated Iwi Organisation (MIO) structures had been established. The result was that appointments of Tangata Kaitiaki/Tiaki by government proceeds independently of the MIO process (Te Ohu Kaimoana, 2017).

## Ongoing Government Obligations Under the Settlement

The settlement was not just a transfer of assets, in the form of quota, cash, and company shares, but a culmination of the much fought-for acknowledgement and acceptance of the government's commitment to meeting its fisheries obligations under the Treaty of Waitangi. This ongoing obligation was recorded in the Deed as follows:

“The implementation of the Deed through legislation and the continuing relationship between the Crown and Māori would constitute a full and final settlement of all Māori claims to commercial fishing rights and would change the status of non-commercial fishing rights so that they no longer give rights to Māori or obligations on the Crown having legal effect but would continue to be subject to the principles of the Treaty of Waitangi and give rise to Treaty obligations on the Crown.”

The Māori envisaged that the government would act in a manner ensuring that the integrity of the settlement was maintained through joint decision-making on future matters affecting it. In recent litigation that still remains under consideration

### Section 3:

The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights



Ngāti Paoa waka  
(canoe)

© Raewyn Peart

by the courts, Ngāti Mutunga, an iwi based in the Chatham Islands, have expressed the bundle of treaty fisheries rights arising out of the 1992 deed to be as follows:

- i) A right to secure possession, use, and development of settlement ITQ as a necessary incident and for an enduring fisheries claims settlement.
- ii) A right to receive ITQ in new species whenever an opportunity exists for the profitable and sustainable harvesting of stocks that are outside the QMS.
- iii) A right to active Crown protection of the property rights attributes of ITQ in order to preserve its value as the agreed currency of the Deed of Settlement; that is to say, a right that the value and quality of title of ITQ will not be debased.
- iv) A right to attenuation of ITQ only when lawful, in good faith, and when consistent with the Deed of Settlement.



Māori ornament

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v) A right to the protection and development of the QMS as part of the continuing relationship between Crown and Māori (by their lawfully established constituents, the Mandated Iwi Organisations (MIOs) and Te Ohu Kaimoana, established in 2004) in order to further the agreements in the Deed of Settlement.

vi) A right to undertake customary (non-commercial) fishing.

(Settlement of Claim, 2016)

## Implementing the Deed

A series of legislative reforms followed, giving expression to the Deed of Settlement and revising the framework within which fisheries were managed. These reforms were described in Section 2a; in brief, they encompassed a commitment to remove any provision to collect resource rentals (government resource taxes) from quota owners. Under the Treaty of Waitangi, Māori were guaranteed te tino rangatiratanga, or unqualified exercise of chieftainship over their lands, villages, and treasures (Treaty of Waitangi, 1840b, Article 2). The resource

rental provision was important; as fisheries assets transferred to Māori were never state-owned, collecting ownership taxes would have been contrary to that ownership right.

Concurrent with the decision to remove resource rent taxes was the establishment, in 1995, of a stand-alone Ministry responsible for fisheries. This Ministry was structured to manage the introduction and application of the cost recovery of management costs and to improve transparency and accountability in the delivery of fisheries services. These arrangements were explicitly established to increase cost accountability and to support the framework for increased engagement of rights-holders in management. A new fisheries law in 1996 set the enabling legislative framework around fisheries which allowed Māori (and other rights-holders) to be engaged in the management and development of fisheries.

## Allocation of Fisheries Settlement Assets

An unprecedented discussion unfolded between 1996 and 2008 regarding how fisheries Settlement Assets should be allocated amongst the Māori. The complexity and importance of this debate, its ultimate resolution, and the ongoing ramifications for the Māori in New Zealand cannot be overstated. Importantly, it not only defined how Settlement Assets would be divided amongst iwi, but also established the mandate and form of Māori tribal organisation for the receipt and management of indigenous fisheries rights for the future. Iwi tribal organisation was ultimately codified in fisheries law for the first time as Mandated Iwi Organisations (MIOs), and 58 iwi were given this formal status.

The allocation debate split iwi into three main factions, which have been described as populationists, coastliners, and a mix of the two. Populationists favoured the division of assets by tribe population, as these were tribes with larger populations and smaller coastlines. Coastliners argued for division by coastline area, as these were tribes with larger coastlines

and smaller populations. These groups also held different views related to how pre- and post-settlement assets should be treated, as well as what the pros and cons were of pan-iwi commercial and non-commercial organisations. The Treaty of Waitangi (Fisheries Claims) Settlement Bill was passed in 1992 despite opposition from the six Māori MPs who argued that it extinguished treaty obligations rather than effecting them.

The Settlement Act 1992 founded the Treaty of Waitangi Fisheries Commission (the Commission) to replace the Māori Fisheries Commission. It also repealed statutory recognition of Māori fishing rights and provided for an agreed-upon process for development and for creating an allocation model for Settlement Asset distribution. The Commission itself had the daunting task of developing an allocation formula and addressed issues such as how to identify beneficiaries, how to define the extent of its roles and functions, and how to ensure accountability to iwi. The Commission's overarching mandate was to protect and enhance Settlement Assets, propose rules and regulations around customary/traditional fishing, and develop Māori capability around fishing.

The Commission established a revised arrangement for the management of Settlement Assets under its oversight. A new company with the same name, Aotearoa Fisheries Limited (AFL), was set up. The new AFL was transferred 50% of quota and cash paid to the Commission by the Crown. The Commission tendered the 10% quota from the PRESA while pursuing a consensus about allocation. By 1993, the PRESA comprised 57,000 mt of quota, a \$58 million NZD value of shares in Moana Pacific Limited, and a further \$50 million NZD in cash. The commission continued to lease quota to iwi and implemented training and development programs to develop Māori fishing capacity.

The allocation discussion continued from 1992 to 1996, seeking a balance between allocating quota based on Māori population and iwi coastline length. The January 1996 deadline for an allocation model galvanized further negotiation and several principles were developed. The first principle for the

allocation of Settlement Assets was that allocation would be to iwi (not to other levels of Māori organization). The second was that there was a need to define inshore and offshore fisheries.

Inshore fisheries would be approached on a coastline basis (mana moana authority over the sea, mana whenua authority over the land), while offshore fisheries would be allocated based on a mix of coastline and population. Cash and shares (in AFL) would be allocated proportionally. A dispute resolution process was established by the Commission in an attempt to avoid further court action. The High Court ruled that allocation should be to iwi based on traditional Māori tribes, and the Court of Appeal ruled that the allocation scheme should take account of urban Māori. These cases led to provisions for Māori not associated with iwi in the Māori Fisheries Act 2004 (discussed below).

"Preparedness" standards were created and released by the Commission, laying out minimum requirements that Mandated Iwi Organisations (MIOs) had to fulfil in order to receive assets. The Commission initially recognized 58 iwi for fisheries allocation, and \$3 million NZD was spent on further developing iwi capabilities.

The MIO criteria were as follows:

- Registration of members and sufficient member numbers.
- A constitution for each iwi organisation (each MIO prepared its own constitution; all had to meet the standards set out by the Commission).
- Members elected in accordance with the constitution of the relevant iwi organisation

(Māori Fisheries Act 2004, Section 14).

An optimum method for allocation was proposed in 1997 and released to iwi to consider at a national meeting, or hui-ā-tau

**The first principle for the allocation of Settlement Assets was that allocation would be to iwi (not to other levels of Māori organization). The second was that there was a need to define inshore and offshore fisheries.**

(TOKM, 1997). A general consensus on this model was reached with a compromise between population and coastline. In 1999, the proposed optimum method gained enough traction (63% of iwi) to report to the Minister of Fisheries (Treaty of Waitangi Fisheries Commission 2003) despite continuing legal action about allocation and the new customary fisheries provisions. The latter issue was ultimately resolved by allowing iwi to issue permits for customary seafood gathering.

A final agreement on an allocation method was reached in August 2002. It encompassed an allocation formula for all Settlement Assets and affirmed the role of MIOs as the beneficiaries as follows:

- Inshore fisheries allocated via a coastline formula.
- Deepwater fisheries allocated via 75% population, 25% coastline.
- Shares in Moana Pacific allocated based on population.
- Cash allocated via population formula, with a \$1 million NZD baseline for each iwi.
- Electoral college to establish board members of Te Ohu Kaimoana Trustee Limited, who would then appoint the directors of Aotearoa Fisheries Limited.

MIOs meeting the preparedness standards would receive quota as well as shares in Aotearoa Fisheries Limited (AFL). Forty percent of AFL's annual profits would be allocated directly to iwi, with the remainder reinvested. Te Ohu Kaimoana Trustee Limited (TOKM) would replace the Treaty of Waitangi Fisheries Commission, oversee governance of AFL, and hold in trust a \$20 million NZD fund for the benefit of Māori not associated with iwi. Te Putea Whakatupu Trust and its trustees hold and invest this \$20 million NZD for the purposes of developing Māori education, skills, advancement, research and development, and access to industry (Māori Fisheries Act 2004, Section 83). A similar trust was set up for Māori development around freshwater fisheries.

In 2003, the allocation agreement was supported by 93% of iwi. After being presented to the Minister of Fisheries and

### Section 3:

The Central Role of the Quota Management System in the Settlement of Māori Treaty Rights



Ngāti Paoa waka  
(canoe)

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introduced to Parliament in November, it was passed into law as the Māori Fisheries Act 2004. The Treaty of Waitangi Fisheries Commission was dissolved and vested in TOKM and AFL. Then, in 2005, the first MIOs were approved under the Act. The process of allocation began as iwi capacity met preparedness standards. This final reconciliation facilitated Māori entry into the fishing industry.

## Distribution and Development of Mandated Iwi Organisations

Fisheries Settlement Assets were steadily allocated to iwi as they sequentially met preparedness standards. Ten years later, in 2014, a forward-looking independent review of the governance arrangements implemented under the Māori Fisheries Act 2004 was conducted. This review recommended that Te Ohu Kaimoana Trustee Limited (TOKM) be reorganised to reinforce and support the role and ascension of iwi in the management and ownership of fisheries assets. As the independent reviewer put it:

"The framework ushered in by the 2004 Act requires change in my view to allow the continued expression of iwi identity and to facilitate their management of their assets as an incidence of ownership. There should be (and can be) a full expression of te tino rangatiratanga by a new framework still crafted so as to protect the durability of the Settlement. It is appropriate that ownership, governance and management arrangements into the future change so to maximise the influence of those whose assets they are over strategic positioning, economic development, economic management, values-based decision-making and corporate objectives for the very purposes the Act prescribes" (Castle, 2005).

By January 2015, 98% of Fisheries Settlement Assets and 86% of coastline assets had been distributed to iwi, totalling around \$750 million NZD. Iwi are now moving to a different stage of development. Many are integrating their commercial activities to gain a better return from the use of their fisheries assets and to enable more effective engagement in the management of these assets into the future.

## Looking Forward and Future Aspirations

TOKM continues to manage the few remaining unallocated assets. Now, however, it is focused more and more on the ongoing job of protecting the integrity of the settlement on behalf of iwi, rather than overseeing its distribution. The ongoing evolution of the Mandated Iwi Organisations, the supporting role of TOKM, and how TOKM will interact with the government on behalf of the Māori as a whole are the subject of a recent strategy drafted by TOKM and released to MIOs (TOKM, 2017). The strategy has four goals:

- I. Align competing Māori political and commercial structures.
- II. Collectively reassert the Deed of Settlement as the basis of the Māori-Crown relationship in fisheries.
- III. Develop fisheries leadership capable of balancing Māori and iwi perspectives.

IV. Proactively develop national and regional fisheries policy based on Māori principles.

The TOKM draft strategy is premised on the observation that the commercial focus of individual iwi has developed without the concurrent strengthening of their collective capacity to manage and protect their Settlement Assets, both commercial and customary. The draft strategy records that "[f]rom a position of strength in 1992, Māori now face a situation where Deed of Settlement rights are under increasing threat of unilateral extinguishment by Government emboldened by Māori complacency regarding fisheries rights protection." As a consequence, the draft strategy proposes that iwi actively promote the protection of their rights under the Deed and focus on the establishment of Crown-Māori working unity in fisheries management.

In 2017, in parallel with the development of a future strategy for iwi engagement in fisheries, the government is conducting a fisheries management system review (MPI, 2016b). TOKM sees this review as a potential threat to the framework established for the use and development of fisheries when the Deed of Settlement was agreed. Apart from the creation of the Quota Management System itself, the Deed of Settlement, implemented in the Māori Fisheries Act 2004, is the only piece of legislation that has recognized fisheries ownership rights in a particular group of people. It gives rise to reciprocal obligations and a special governance relationship that does not exist between the government and other commercial fishing interests. The nature of this ongoing relationship is at the core of future iwi engagement and how the reform process will develop.

Jamie Tuuta, current Director of TOKM, celebrates the progress that has been made since the Deed of Settlement, observing that "the biggest concept of the Settlement is that the Treaty relationship can now be acted on!"

**"The biggest concept of the Settlement is that the Treaty relationship can now be acted on"**

—Jamie Tuuta, Director, TOKM



# The Principle Institutions Engaged in Fisheries Management in New Zealand

*The flag of New  
Zealand*

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## SECTION 4

# The Principle Institutions Engaged in Fisheries Management in New Zealand



Under New Zealand's Quota Management System, government, Māori, and industry all play essential roles in delivering fisheries management. Additional key stakeholder groups, including recreational fishing associations, environmental non-governmental organisations (NGOs), researchers/academics, and the interested public, also actively participate in the fisheries management processes. The responsibilities and engagement of groups other than the Māori (discussed in detail in the previous section) is described below.

## Government

The government sets fisheries policy, delivers or contracts for research and services essential to meeting management objectives, and is responsible for monitoring and compliance. Over the QMS's 30-year history, there have been several Ministerial/departmental arrangements for delivering on these responsibilities.

**Ministry of Agriculture and Fisheries (1986-1995):** When the QMS system was launched, the provision of policy advice on fisheries and the delivery of operational functions was the responsibility of the Ministry of Agriculture and Fisheries, a pan-sector Ministry. Annual appropriations to the Ministry for these activities during this period fluctuated between around \$56 and \$48 million NZD. In 1995, the Ministry of Agriculture and Fisheries was abolished and its responsibilities transferred into separate organisations: its responsibilities for fisheries policy and operations were transferred to the newly created Ministry of Fisheries, while most research responsibilities were transferred to the newly created National Institute of Water and Atmospheric Research (NIWA).

**Ministry of Fisheries (1995-2012):** The new stand-alone Ministry of Fisheries was established within the context of cost recovery and other significant changes to the QMS under the Fisheries Act 1996. Given the complexities of the new law,

provision was made to phase in its various parts by Order in Council (i.e. regulations set by the Cabinet). In addition, in 1997, the Ministry was required to implement research activities through contestable tender, rather than having all research assigned to NIWA. These new arrangements were aimed at increasing the transparency of the delivery of services and were accompanied by a legislative requirement that the Ministry

**TABLE 4.** Contract and Devolved Services Provided by FishServe

<b>Contracted service (Crown Responsibility)</b>	<b>Devolved Service (Approved Service Delivery Organization (ADSO) Responsibility)</b>
Quota Allocation	Quota Register Management Property Rights Transfers
Fishing Permits	ACE Register Management Property Rights Transfers Annual Allocations
Crown Revenue Management Cost Recovery levies Deemed Value Invoicing Debt Management	Client Registration/Management
Aquaculture Registers	ACE Balancing Monthly Harvest Return Processing Calculating Catch against ACE
Foreign Licensed Access and Special Approvals	Licensed Fish Receiver Licensing Returns Processing
High Seas Fishing Permits	Fishing Vessels Register Management Certificates of Registration
Catch Effort Returns Data Entry Validation Overdue management	Caveats and Mortgages Registration Removal

consult with stakeholders on the “nature and extent” of fisheries services that would be cost-recovered, including their costs. Extensive systems and processes were built around annual fisheries management and business planning cycles to meet these obligations. The core fisheries management process revolved around the following five sequential steps: research planned, research contracted, fisheries assessed, management advice provided, and management implemented. A separate but linked business planning process consulted on the nature and extent of fisheries services, including administration (i.e. quota registry and catch monitoring and balancing), regulatory, research, and enforcement services.

In 1999, there were a number of important changes made to the responsibilities and operation of the Ministry of Fisheries. As a result of a Parliamentary Enquiry responding to long-standing concerns raised by industry, the cost-recovery approach was changed from “avoidable cost” to “attributable cost.” The concept of fisheries planning was reintroduced into the Fisheries Act 1996, and the provision of registry-based services such as ITQ trade registries, permit registries, and catch-balancing and recoding systems were outsourced to FishServe (Table 4; a fuller description of FishServe is found on page 76).

**The Ministry for Primary Industries (2012-present):**

In 2012, the Ministry of Fisheries was again merged with other primary-industry sector groups into a new super Ministry, the Ministry for Primary Industries (MPI). The Minister of Primary Industries oversees the delivery by the Ministry’s primary industry outputs, including those for fisheries. There are four required “outputs” for Fisheries, as follows:

- Fisheries Policy Advice: This category is limited to the provision of advice (including second-opinion advice and policy advice led by other agencies) to support decision-making by Ministers on government policy matters relating to the development of standards and guidelines for the sustainable and efficient utilisation of New Zealand’s fisheries and to the promotion of New Zealand’s interests in an international context.

- **Operational Advice on Sustainability and Management Controls in Fisheries:** This category is limited to operational advice to support decision-making by Ministers on government policy matters relating to sustainability and management controls for New Zealand's fisheries.
- **Fisheries Enforcement and Monitoring:** This category is limited to informing, assisting, directing, and enforcing adherence to New Zealand fisheries laws.
- **Fisheries Management:** This category is limited to implementing Ministerial decisions on sustainability and management controls for New Zealand fisheries.

These outputs collectively represent the government's annual investment in fisheries management as detailed in the Parliamentary Appropriations process (see also Section 2d: "Funding Fisheries Management"). Excluded from the government appropriations process are expenses associated with the delivery of a range of public registers for fisheries management, including QMS administration. The Fisheries (Registers) Regulations 2001 require the Ministry of Fisheries Chief Executive to keep the following public registers: quota, Annual Catch Entitlement (ACE), permits, fishing vessels, automatic location communicator, high seas permit, fish farmer and aquaculture agreement.

MPI has begun a consultation on a revised approach to the management of fisheries. Billed as a "major shift planned for fisheries management," the consultation document proposes a number of changes in the objectives for fisheries management and in the way these objectives will be realized. In particular, the consultation document proposes a different approach to "shared fisheries," defined as fisheries that are fished by commercial, recreational, and customary fishers, than is used for deepwater and mid-depth fisheries, which are exclusively fished by the commercial sector. This alternative approach is aimed at maximizing abundance and better recognizing recreational value when setting TACCs (MPI, 2016b). The consultation document also proposes three options for operationalizing these revised objectives. In contrast to earlier approaches, all its proposed

#### **Section 4:**

The Principle Institutions Engaged in Fisheries Management in New Zealand



*Fishing vessels in the  
Westport Harbour*

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options seek to reinforce the role of the government in management decision-making, rather than aiming at devolving these responsibilities. This is particularly the case in the context of shared fisheries, where "decisions relating to allocation" would remain with the Minister. In fisheries that are solely commercial, decision-making could be delegated to the Ministry.

**Department of Conservation (1987-present):** Unlike the MPI, which has no direct statutory basis, the Department of Conservation (DoC) was established under the Conservation Act 1987. It has a range of statutory functions under that legislation, including managing conservation land and indigenous freshwater fisheries, as well as advocating for the conservation of natural and historic resources more generally (Conservation Act 1987, Section 6). The Department also administers a range of marine-related legislation, including the Marine Mammals Protection Act 1978, Wildlife Act 1953, and Marine Reserves Act 1971. Of direct relevance to fisheries management, DoC manages the Conservation Services Programme, which levies quota owners to fund research and action aimed at reducing the impact of fishing activity on protected species (see Section 5). Under the Marine Mammals Protection Act, DoC is also empowered to prepare Population Management Plans to help manage the impacts of marine mammal by-catch in fisheries.

## Seafood Industry

The Seafood Industry in New Zealand is comprised of multiple actors, including quota owners, fishers (some of whom are also quota owners, but many are not), processors, and the Māori, who cut across all the groups. There are six large, vertically integrated seafood companies in New Zealand: Moana New Zealand Ltd, Sanford Ltd, Talley's Group Ltd, Sealord Group Ltd, Independent Fisheries Ltd, and Vela Fishing Ltd. Together, these companies account for a large proportion of the seafood industry by volume and value. The New Zealand seafood industry is highly organised. It has also developed a high level of fisheries management capacity and responsibility, both within individual corporate groups, including Māori-owned entities, and through the purpose-designed Stakeholder Representative Entities aimed at promoting industry development and implementing fisheries management under the QMS.

The current structure of the seafood industry has evolved in response to the opportunities and financial pressures created by the QMS. Leading up to the establishment of the QMS in 1986, the activities of the Commercial Fisherman's Federation (representing owner operators) and the Fishing Industry Association (representing processors and marketing companies) defined the future structure of the industry. Commercial Fisherman's Federation members, rather than the processing and marketing companies, were most engaged in the fisheries planning and regulatory processes led by the Ministry of Agriculture and Fisheries. This is because most Federation members were in-shore fishers and owner operators, and were therefore directly impacted by these regulatory processes. The QMS (and the later introduction of proportional quota) changed this dynamic dramatically. The processing and market sectors of the industry, through the activities of the Fishing Industry Association, suddenly had a direct interest in the catching sector and its development through allocations and investment in quota. The large, vertically integrated companies looked to secure quota and catch rights to underpin their investment in value-chain development, as well as to secure the efficiencies of scale

### Section 4:

The Principle Institutions Engaged in Fisheries Management in New Zealand



Seafood processing facility

© Josh Griggs

and increased profit promised under the QMS (Johnson & Haworth, 2004).

The Fisheries Act 1996 stimulated the establishment of Commercial Stakeholder Organisations (CSOs), comprised mostly of corporations with mandates to represent quota interests in specific fisheries or fish complexes on behalf of quota owners. In 1997, the Commercial Fisherman's Federation and the Fishing Industry Association furthered these initiatives by agreeing to consolidate their activities (along with residual functions retained from the now defunct Fishing Industry Board) under a newly formed organisation. This new entity was named the Seafood Industry Council (or SeaFIC). SeaFIC was established as a corporation with the expectation that it would act in a commercial role to provide a range of fisheries management services to its shareholders. SeaFICs shareholders, consistent with the Fisheries Task Force recommendations, were the CSOs that were established to represent and manage particular fisheries or groups of fisheries. Some 30 such entities were established, with varying capacity to manage particular fisheries or fish stocks. Over time, the quota ownership

interests in SeaFIC, represented through these CSOs, exceeded over 94% of the quota owned, including large holdings now in the hands of Māori (Harte, 2008).

SeaFIC established a purpose-designed subsidiary company in 1998 called Commercial Fisheries Services Limited (or FishServe) to provide a range of administrative services to the commercial fishing industry in support of the Fisheries Act 1996. FishServe is an Approved Service Delivery Organisation (ASDO) and was authorized by the Minister in 2002 to carry out certain devolved services on behalf of the Crown. It also provides a range of services under contract to the Crown. Table 4 (page 73) lists the types of services provided by FishServe. The costs for the delivery of most devolved services are recovered directly from the industry via transaction and general levy charges, with other services being paid for by contract from the government. Included within these services is the management of catch registries, fishing permit registries, quota share and ACE registries, license fish receiver returns, cost recovery and deemed value records and invoicing systems, and the ACE against catch-balancing systems. Information held in these systems informs the fisheries management processes, including stock assessment and compliance.

Stakeholder Representative Entities (SREs) were established to provide management services for quota owners and other seafood industry participants. They are self-funded industry organisations that are an amalgamation of the original quota-based CSOs but that also include other representative bodies such as Aquaculture New Zealand. SREs utilise FishServe's public data registries for fisheries management and commercial purposes. For example, some SREs use Catch Per Unit Effort (CPUE) indices within catch and effort databases to set sub-catch limits within their fisheries. They implement these sub-catch limits through agreements to shelve (not fish) a percentage of Annual Catch Entitlement catching rights during a particular year or across several years. In 2013, following the merger of the stand-alone Ministry of Fisheries into the multi-sector Ministry for Primary Industries, SeaFIC and the CSOs went through a major change: the centralised levying process

administered by SeaFIC under the Commodity Levies Act 1991 was discontinued in favour of devolving science and other management capacity to SREs. Under this new arrangement, the fisheries management and science capacity within SeaFIC was disbanded. SeaFIC itself was reduced in capacity to a small team focused on industry strategy and promotion and was renamed Seafood New Zealand ([www.seafood.org.nz](http://www.seafood.org.nz)).

Stakeholder Representative Entities have become the central groups responsible both for the provision of management advice in their respective fisheries and for the commissioning of supporting services such as research (see box below). All fin-fish fisheries and deepwater species are represented through the Deepwater Group Ltd, Fisheries Inshore New Zealand Ltd, and Southern Fisheries Management Company Ltd ([www.deepwatergroup.org](http://www.deepwatergroup.org), [www.inshore.co.nz](http://www.inshore.co.nz)). There are also a range of SREs that have coalesced around specific fisheries, including

## Activities of Stakeholder Representative Entities (SREs)

The SREs and their owners are involved in a diverse range of activities aimed at improving the knowledge and management of fisheries and addressing impacts on the environment. These activities are outlined in publicly available business and fishery plans linked directly to harvest strategies and high-level management plans developed by the Ministry for Primary Industries. These activities, which can be viewed on their respective websites, are considerable in scope. The following lists only a sample:

- Reducing by-catch in inshore fisheries (see Fisheries Inshore "Six Point Plan" at [www.inshore.co.nz](http://www.inshore.co.nz)).
- Closing some seafloor areas to deepwater trawling, now regulated as benthic protection zones.
- Reducing interactions with seabirds through the adoption of smart fishing practices (see [www.southerseabirds.org](http://www.southerseabirds.org)).
- Working with other stakeholders to reduce interactions with dolphins.
- Supporting the implementation of the National Plan of Actions for Sharks through the development of industry operational procedures.



A boy poses with his father and his fish

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the Rock Lobster Industry Council ([www.nzlobster.co.nz](http://www.nzlobster.co.nz)) and the Paua Industry Council ([www.paua.org.nz](http://www.paua.org.nz)), and there are SREs dedicated to the management of specific scallop and oyster fisheries. Some fisheries, such as surf clams, seaweeds, and cockles are represented directly by commercial quota owners who have majority share holdings in these stocks.

Currently, the collective seafood industry is supported nationally by Seafood New Zealand ([www.seafoodnewzealand.org.nz](http://www.seafoodnewzealand.org.nz)) and its operational subsidiaries, Commercial Fisheries Services Limited (FishServe, [www.fishserve.co.nz](http://www.fishserve.co.nz)), Seafood Innovations Limited (SILs, [www.seafoodinnovations.co.nz](http://www.seafoodinnovations.co.nz)), and FishServe Innovations New Zealand (FINNZ, [www.finnz.com](http://www.finnz.com)). These companies provide industry advocacy (SNZ), fisheries services (FishServe), research funding (SILs), and business analysis and IT consulting services (FINNZ).

The seafood industry, through Seafood New Zealand and via the range of stakeholder entities, continues to support initiatives that increase their ability to engage in the management of fisheries. With its recent submission to the Future of Fisheries process, the seafood industry seeks additional government support to enable collective action amongst quota-owner groups in order to make rules to improve management in their collective interests. It is also continuing to promote the implementation of the fish-plan framework as a stakeholder-driven initiative. The formal approval of such plans, accompanied by Approved Service Delivery Organisation status for industry, offers a means of further enabling management by stakeholders (see submissions at [www.mpi.govt.org](http://www.mpi.govt.org)).

## Recreational Fishing Stakeholders

Recreational fishing has long been a popular activity in New Zealand, with the quantity of fish caught in some areas rivalling the commercial catch. Recreational fisheries are diverse and include any fishing not undertaken for financial reward (except for Māori non-commercial customary fishing, which is managed separately). This includes fishing for subsistence, tourist or charter fishing, fishing for leisure, and non-extractive uses. Recreational fishing is allowed by exemption to the general legislative prohibition that requires fish to be taken under the authority of a permit. This sector is, however, restricted by minimum fish size and bag limits, gear and spatial controls, and season length.

Recreational fishing is significant to the QMS because recreational and commercial fishers often target the same inshore stocks in what are referred to as shared fisheries (see also Section 2b). Effective management of shared fish stocks requires an integrated approach between the management of the two sectors as well as between the property right-based QMS and the recreational fishing open access regime. For example, restraining commercial catch within a TACC, in the context of increasing recreational catch, may not serve to keep

the total harvest to sustainable levels. Conversely, where a stock is declining because a TACC is set too high, recreational fishing opportunities can be adversely affected. A key issue has been how respective allowances in shared fish stocks should be allocated between the two sectors.

Prior to the 1970s, New Zealand recreational fishing interests were primarily represented by sporting clubs and bodies. In 1978, the New Zealand Recreational Fishing Council (NZRFC) was formed as a recreational advocacy and managerial group to pursue "guaranteed access to abundant fisheries." When the QMS was subsequently introduced in 1986, one of the

stated aims of the new system was to enhance the recreational fishery. Bag limits were to be set for stocks introduced into the QMS to prevent commercial fishing on unregistered vessels, but they were to be set at a level "so as not to affect genuine recreational fishing." The intent was not to restrict the size of the recreational harvest where fisheries were shared between recreational and commercial sectors (MAF, 1984). At that point, recreational fishing was largely considered to be a marginal activity with little impact on the sustainability of fish stocks, and so the sector was not incorporated into the QMS (Hersoug, 2002).

## Participation in Recreational Fishing

National surveys indicate that the level of participation in freshwater and marine fishing is high but dropping. In 1997/98, 24% of the adult population participated, while 19.5% participated in 2013/14, totalling 646,000 active recreational fishers throughout the country. Fishing was the second most popular recreational activity for men, with 29.2% participating in 2013/14, and the third most popular activity for Māori (27.5%). The largest drop-off in participation between 1997/98 and 2013/2014 was by Pacific People (27% to 14%) and young adults (27% to 16%) (Sport New Zealand, 2013, 2015). This downward trend in the level of participation is not similarly reflected in the number of boats on the water. In 1997, there were an estimated 240,000 boats, or one boat for every eight people. In 2009, the number of boats had almost doubled, totalling 450,000 (Maritime New Zealand, 2009); this number doubled again by 2014 to reach 900,000, or one boat for every five people (Maritime New Zealand, 2014). By 2015, the number of recreational boats on the water had increased to 960,000 (Maritime New Zealand, 2016).

A substantial proportion of the boats are not used for fishing, however, and of those that are, many are used solely for freshwater fishing. Nevertheless, this steady rise in the number of boats represents a potential increase in latent fishing effort.

Several surveys have also been undertaken to estimate the total catch by marine fishers. A panel survey of over 7,000 recreational fishers nationwide during the 2011-12 fishing year found that over 17 million finfish, shellfish, and other species were harvested by recreational fishers during over 2.4 million fishing trips. The most common method of fishing was with a rod or line from a trailer boat (42.6% of total trips), and the majority of trips were undertaken along the north-east coast of New Zealand in Fisheries Management Area 1 (FMA1) (57.9%) (Wynne-Jones et al., 2014).

A survey of recreational fishing in FMA1 during the same year came up with similar harvest estimates using aerial vessel counts and boat ramp surveys. The total recreational harvest for snapper was estimated

to be 3,754 mt (approaching the TACC for the area of 4,500 mt) and 942 mt of kahawai (approaching the TACC of 1,075 mt), highlighting the shared nature of these fisheries. Comparison with a similar survey undertaken during the 2004-05 fishing year indicates a substantial increase in the harvest levels of these species over seven years, from 2,419 mt for snapper (55% increase) and 530 mt for kahawai (78% increase). The survey credited these increases to an improvement in catch size and rates, rather than an increase in effort. Conversely, there was a marked decline in landings of red gurnard, which dropped from 127 to 24 mt over the same period (Hartill et al., 2013). More recent estimates, based on ramp cameras and surveys, have indicated a significant drop in total recreational catch of snapper in FMA1 to 1,598 mt in 2013-14, rising slightly to 1,917 mt in 2015-16. This indicates the fluctuating nature of recreational harvest, most likely due to the changing catchability of fish and to weather conditions. It does not appear that, overall, recreational harvest in FMA1 is currently increasing (Hartill, 2016).

In 1989, the Minister of Fisheries, Colin Moyle, issued a National Policy for Marine Recreational Fisheries. The policy document discussed the need to address the impacts of overfishing on recreational fisheries. It proposed “reasonable recreational access to fisheries resources” and considered licensing “inappropriate” in the recreational sector. This document contained a statement that has been much cited by the recreational sector and is commonly referred to as “Moyle’s promise”:

“Preference will be given to non-commercial fishing in areas readily accessible to and popular with the public, where a species is not sufficiently abundant to support both non-commercial and commercial fishing” (MAF, 1989).

“Moyle’s promise” was not articulated as policy in the subsequent Fisheries Act 1996, which simply specifies that the Minister shall have regard to the TAC and “allow for recreational interests” when setting the TACC (Section 21(1)). In 2003, the Minister of Fisheries made it clear that Moyle’s promise was not carried through into law. The Courts have also affirmed that there is no mandatory preference for recreational fishing when allocating a stock between fishing sectors, and it remains a matter for the Minister’s discretion (see Case Study).

## Recreational Fishing Management

Recreational fishing in New Zealand is open access, with seasonal closures and bag limits being the primary mechanisms for management. There are widespread reports that recreational fishers currently perceive their fishing experience as being diminished from the greater abundance they experienced in the past (Bess, 2016; [www.legasea.org](http://www.legasea.org)).

Over the past 25 years there have been various efforts to reform the system to manage recreational fishing activity, but little progress has been made. During the 1990s, when reviews of the fisheries management system were undertaken, various proposals were put forward in the Pearse and Fisheries Task Force reports for integrating recreational fishing into the

## CASE STUDY: Court Findings on the Recreational Share in Fisheries

The issue of the appropriate allocation between the commercial and recreational sectors under the earlier Fisheries Act 1983 was first considered by the High Court in 1997 in respect to the northeast snapper fishery. The Minister decided to reduce the TACC from 4,928 to 3,000 mt, whilst at the same time reducing the recreational bag limit from 15 to 9. Amongst other measures, he also proposed to establish a seasonal closure for commercial fishing in the inner Hauraki Gulf to reduce juvenile by-catch. The decision was legally challenged by fishing industry parties. According to the Court, however, “It is not outside the purposes of the [1983] Act to allow preference to non-commercials (e.g. greater CPUE) to the disadvantage in fact of commercials and their valued ITQ rights, even to the extent of the industry’s worst case of a decision designed solely to give recreationals greater satisfaction” (New Zealand Federation of Commercial Fishermen et al v. Minister of Fisheries, 1997, p. 90).

Eight years later, in 2005, the New Zealand Recreational Fishing Council (NZRFC) and the New Zealand Big Game Fishing Council joined to challenge the Minister’s allocation decision in what became known as the *Kahawai* case. The case focused on the setting of the TACC for the kahawai 1 stock during the 2004 and 2005 fishing seasons, and it went right up to the Supreme Court (New Zealand’s highest Court) where a decision was released in May 2009. The decision confirmed that the Minister has discretion to provide for the recreational catch. Moreover, the majority view was that the Fisheries Act 1996 does not indicate that the recreational sector should take any substantial priority over commercial interests and that “the allowance for recreational interests is to be made keeping commercial interests in mind.” In addition, the majority position held that recreational allowance was to be based on “an estimate of what recreational interests will catch” taking into account the Minister’s ability to control that catch. However, the majority view also stated that the Fisheries Act envisages that the allowance for recreational interests will be a reasonable one in all the circumstances (NZRFC and ors v. Sanford and ors, 2009, paras 55-61).

QMS. These included recommendations that recreational quota be allocated to the sector and held either by trusts, new regional associations, or the regional or national government. Trading could then take place between the commercial and

recreational sectors. Such proposals were intended to provide greater certainty and strength to the recreational fishing "right" (Hersoug, 2002; Walshe, 2010), but there was a strong backlash by the recreational sector to the concept of a fixed allocation. The issue was shelved in 1993 (Borch, 2010).

In 1998, the New Zealand Recreational Fishing Council (NZRFC) partnered with the Ministry of Fisheries to develop proposals for the future management of the recreational sector. A set of proposals was contained in a public consultation document entitled "Soundings," which was released for public comment in 2000. This document contained three options: retention of the status quo, which left allocation up to the discretion of the Minister; allocation of a fixed proportion of the TAC between the recreational and commercial sectors; and greater involvement of recreational fishers in fisheries management through recognised recreational fisheries management groups (Ministry of Fisheries and NZRFC, 2000; Hersoug, 2002). The proposals generated a vigorous response of 62,117 submissions from the public, resulting in the establishment in 2000 of a breakaway recreational fisheries group called "option4." Option4 articulated a set of principles which included no licensing of recreational fishers and a priority right over commercial fishers in shared fisheries. In the face of such trenchant opposition, the initiative to reconsider the future management of the recreational sector stalled.

In 2005, the government established six regional recreational fishing forums and a Recreational Fishing Ministerial Advisory Committee (Borch, 2010) before making another attempt to resolve the recreational fisheries question. Then, in 2006, the government released a "Shared Fisheries" consultation document containing a range of proposals, including one that would establish a minimum tonnage for recreational take (around 20% of a baseline recreational allocation) that would have priority over commercial harvest (Ministry of Fisheries, 2006). It also proposed three options for resetting allocations between commercial and recreational fishers, including the use of an independent panel or person, basing allocations on a valuation study to estimate the highest-value allocations for particular

#### **Section 4:**

The Principle Institutions Engaged in Fisheries Management in New Zealand



*Recreational fishers  
near Auckland*

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fisheries, or using negotiated agreement. In addition, the document contained proposals for local area management where priority could be given to non-commercial fishing (Ministry of Fisheries, 2006). The proposals were strongly opposed by both the commercial and recreational fishing sectors and were not progressed (Bess, 2015).

A more recent government initiative in this area was the announcement, prior to the 2014 national election, that the National party would create recreational fishing parks in the Hauraki Gulf and the Marlborough Sounds if re-elected. The proposal was further outlined in a consultation document on a new Marine Protected Areas Act released in January 2016 (MfE, 2016). The document proposed that most commercial fishing would be excluded from the new parks, although harvesting of some species might continue where there was "limited competition between recreational and commercial use of a species and there is a strong rationale for commercial fishing to remain." The document suggested that compensation be paid to quota owners (but not to ACE fishers or crew) "where the impact on commercial fishing is deemed to be materially



Recreational fishing  
poles and net

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significant." It proposed to establish an advisory group for each area to provide advice on ongoing management (MfE, 2016). This proposal received strong opposition from commercial and Māori fishing interests, and has yet to proceed.

In 2013, the "Our Fishing Future" initiative was launched, commencing with a "Future Search" collaborative workshop held in Nelson. A total of 66 people attended from the commercial, recreational, customary, environmental, science, and governmental sectors. The workshop considered how "recreational fishing interests could be better integrated into the fisheries management framework and decision-making processes." This led to the establishment of Our Fishing Future as a legal entity which has now largely taken over the role of the New Zealand Recreational Fishing Council. A second group, closely affiliated with the New Zealand Sport Fishing Council (NZSFC), continued to advocate against a proportional share in QMS species and was active in fisheries management issues until 2011. It was disestablished in favour of the NZSFC, and the NZSFC's

funding and advocacy arm, LegaSea, which was set up in 2012. The recreational fishing sector remains politically split between these two broad groupings.

The issue of how best to manage recreational fishing remains unresolved. The government's 2016 consultation document on the Fisheries Management System Review touches on some issues of relevance to the recreational sector, including the allocation between commercial and non-commercial fishers and the collection of information about the recreational sector, but it does not propose specific implementation options (MPI, 2016b).

Yet interest remains in determining a positive way forward. The New Zealand Initiative recently released a report to elicit public debate about the future of recreational fishing. The report includes draft recommendations for reforming recreational fishing management in New Zealand (Bess, 2017). A number of its draft recommendations are based, in large part, on the Western Australia model, which key stakeholders from New Zealand learned about first hand during a site visit in May 2017. Some of the report's recommendations are appealing to recreational fishing interests, particularly the focus on improving the management of shared fisheries, improving the information available on recreational fishing, and establishing a Western Australian-type professional, nation-wide organisation to represent recreational fishing interests at the highest levels. There is also support for funding the organisation by way of petrol excise duties already paid by recreational boat users, as they currently receive no benefit from paying the duties. However, some of its recommendations, particularly those around licensing as an alternative source of funding, have met with a strong negative reception from both [government](#) and [LegaSea](#). The seafood industry, however, strongly [supports the range of recommendations](#) and the timeliness of debating them. The recommendations are being consulted on through a series of meetings around the country. After the consultation, the draft recommendations will be finalised and presented to the new government in late 2017.

## Environmental Stakeholders

The Fisheries Act 1986 (Section 12) explicitly recognises the strong interest of the environmental sector in fisheries management decision making. It requires consultation with “such persons or organisations as the Minister considers are representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in

the area concerned, including Māori, environmental, commercial, and recreational interests.”

The capacity of the environmental sector to engage directly in fisheries management processes has been limited, however, with only a few individuals routinely involved in formal fisheries stock-assessment discussions. Environmental NGOs are more often represented in groups focusing on managing impacts on

### Overview of the Environmental Sector

There are five main national environmental organisations in New Zealand, all of which have been active in fisheries management issues in various ways. Three are solely New Zealand-based organisations, while two—WWF New Zealand and Greenpeace New Zealand—are associated with their international networks. Each organisation has developed its own niche within the spectrum of activities including direct activism (a focus of Greenpeace New Zealand), submitting and engaging in fisheries working groups (Forest and Bird

and Environmental and Conservation Organisations of Aotearoa [ECO]), working collaboratively with other stakeholders and the fishing industry (WWF New Zealand), and undertaking legal and policy analysis work (Environmental Defence Society [EDS]).

More recently, a wider range of international environmental NGOs has become active in New Zealand marine-related issues. In 2010, the Pew Charitable Trusts established a presence in New Zealand focused

primarily on obtaining marine protection in the Kermadec region as part of their Global Ocean Legacy Program. In 2014, Conservation International formed a collaboration with and based staff at the University of Auckland to develop a new marine research programme for the Pacific region. In 2016, the Nature Conservancy began the process of establishing a New Zealand branch with an initial focus on marine and freshwater issues.



#### Royal Forest and Bird Protection Society (Forest and Bird)

*Established in 1923 to protect and restore wildlife and wild places*

Large branch-based organisation. Produces a 'Best Fish Guide'. Active in seabird and marine conservation, making submissions and fisheries working groups



#### Environmental and Conservation Organisations of Aotearoa (ECO)

*Established in 1972 as an umbrella group for environmental organisations*

Active in fisheries and marine advocacy, making submissions and fisheries working groups



#### WWF New Zealand

*Established 1975 as part of the WWF global network*

Strong focus on marine conservation and science. Works collaboratively with government and the fishing industry



#### Greenpeace New Zealand

*Established 1974 and aligned with Greenpeace International*

Active campaigning and non-violent direct action on fisheries and wider marine issues



#### Environmental Defence Society (EDS)

*Established 1971 to litigate on behalf of the environment*

Strong legal and policy focus on marine issues. Both litigates and works collaboratively with sectors.



Salvin's albatross

© Ed Dunes

protected species and the marine environment. These include the Aquatic Environment Working Group, Conservations Services Programme Technical Working Group, the Seabird Advisory Group, and multi-stakeholder collaborative forums established to develop threat management plans for New Zealand sea lions, Hector's and Māui dolphins, and national plans of actions for sharks and seabirds.

Environmental NGOs have focused their efforts on a range of other activities designed to influence fisheries matters. For example, Forest and Bird produces a "Best Fish Guide" in the form of a website and mobile app in an endeavour to influence consumer behaviour. This uses a traffic light system to rank more than 85 commercial seafood species based on their impact on the marine environment ([www.bestfishguide.org.nz](http://www.bestfishguide.org.nz)). WWF New Zealand is working directly with major fishing companies. It has formed a partnership with the largest iwi-owned company, Moana New Zealand Ltd, to address matters such as Māui dolphin and seabird by-catch. Greenpeace New Zealand recently launched a public campaign against self-monitoring in the fishing industry as well as the devolution of functions to FishServe. Environmental Defence Society is undertaking policy research focused on potential improvements to the operation of the fisheries management system. Environmental NGOs in New Zealand also engage in the Marine Stewardship Council certification processes for New Zealand fisheries, including hoki and orange roughy, by providing information and, in some cases, lodging objections.

## Interactions Among Sectors

The legislative framework for New Zealand's QMS provides for the Māori and a wide range of stakeholders to participate in fisheries management. However, the government and quota owners have the most explicit roles, with many of the latter having invested heavily in developing capacity for engagement in management. Interactions among all sectors have proved challenging and are characterized by high levels of conflict.

Fisheries management decisions have been litigated in the courts by both the commercial and recreational sectors, though the commercial sector engages in legal disputes more frequently. The dispute over allocation in the shared snapper fishery highlights some of the tensions between commercial and recreational fishers: "The commercial fishery was over-located due to quota appeal awards, was still well below target biomass, and needed rebuilding. Amateurs felt they were being disadvantaged due to low abundance caused by high commercial take, while commercial fishers felt that reducing their catch limits and not the amateur limits was a reallocation of their rights to non-commercial use" (Connor & Shallard, 2010).

Several commentators have noted that there have been no effective mechanisms to bring the various parties together in a constructive manner, and that this has frustrated attempts to continue the evolution of the QMS. Walsh (2010) has noted, for example, that "...social capital within and between sectors (including the State) is poorly developed in New Zealand, and the lack of co-operation between the sectors is a significant barrier to effective governance of New Zealand fisheries ... many fisheries management decisions are outcomes of temporary processes organised around a particular problem so they rely on an established background of cooperation." Connor and Shallard (2010) suggest that "the lack of investment in multi-stakeholder processes and consequent building of social capital amongst stakeholder groups at both local and national levels is a key barrier to moving on from the current frustrated status."

# Fisheries Management Within the Wider Context of Ocean Conservation and Management

*A sea lion in the  
middle of a fight on  
the Otago Peninsula*

© Rodrigo Legorreta, TNC

## SECTION 5

# Fisheries Management Within the Wider Context of Ocean Conservation and Management



Prior to the 1990s, there was only patchy legislation and policy on addressing potential conflicts between fisheries and other marine uses. There was some limited planning for harbour areas thanks to maritime planning schemes prepared under the Town and Country Planning Act 1977, but, overall, only a few environmental statutory provisions targeted the marine area. Most seabirds and some fish species and corals were protected from direct harvest during the 1950s by the Wildlife Act 1953, and marine mammals were similarly protected in 1978 under the Marine Mammals Protection Act 1978. Yet fisheries by-catch of protected species was not (and is still not) deemed to be an offence so long as the incidents were reported.

In 1971, the Marine Reserves Act was passed when marine scientists based at the University of Auckland's Leigh Marine Laboratory became concerned that their *in-situ* experiments would be disrupted by fishing activity. This was followed in

1975 by the creation of New Zealand's first no-take marine reserve near Leigh, a 5.2 km<sup>2</sup> area between Cape Rodney and Ōkakarī Point. Prior to the QMS coming into force, only one additional marine reserve was created under this law, consisting of a 24 km<sup>2</sup> marine area surrounding the Poor Knights Islands further north, though it initially allowed recreational fishing (by floating line only). A small number of other types of protected areas were created under several existing pieces of legislation for a variety of purposes, including the protection of juvenile fish habitat (Handley, 2006). These included the 156 km<sup>2</sup> area closed to power fishing off Separation Point in Tasman Bay, the 3.5 km<sup>2</sup> no-take area at Tāwharanui, and a no-commercial take area off Mimiwhangata of 20 km<sup>2</sup>.

Fisheries legislation in New Zealand before 1983 did not explicitly address environmental matters. The Fisheries Act 1983, which replaced the antiquated 1908 fisheries legislation,

contained provision for the development of fisheries management plans “to conserve, enhance, protect, allocate, and manage” fishery resources, but it contained no explicit environmental purpose or principles. The Fisheries Amendment Act 1986, which provided the initial framework for the QMS, did not elaborate on how environmental matters should be addressed. It left the topic to be covered in the fisheries-specific management plans it provided for, but these plans were not fully realized. With the passage of the New Zealand Fisheries Act 1996, a number of specific provisions were introduced to address the environmental impacts of fishing activity within the framework of the QMS.

While the QMS was being established, a reform of New Zealand’s planning and environmental laws was also in process that culminated with the Resource Management Act in 1991 (RMA). This was a broad piece of legislation that applied to the management of land, air, freshwater, and the territorial sea (termed “coastal marine area”). The RMA repealed and replaced 78 statutes and regulations and amended numerous others. Its overriding purpose was “to promote sustainable management of natural and physical resources,” reflecting the “sustainable development” agenda which had emerged internationally after the 1972 United Nations Conference on Environment and Development in Stockholm. Fisheries management, however, was explicitly exempted from the jurisdiction of the RMA and stayed under the framework of the Fisheries Act 1983.

Yet at the same time as the RMA was coming to fruition, the government was starting a process to review the Fisheries Act. The Pearse report, released in July 1991, covered a range of issues that included the environmental impacts of fishing. During his wide consultation process, Pearse found substantial consensus that environmental concerns were not well handled by the QMS and that neither environmental groups nor the fishing industry had confidence in the QMS’s uncertain arrangements for managing environmental impacts. He concluded that, “while the quota system facilitates the management of fishing, it depends on other processes to identify and

## Section 5:

Fisheries Management within the Wider Context of Ocean Conservation and Management



The coastline  
of Leigh Marine  
Reserve

© Raewyn Peart

protect public interests that are sometimes adversely affected by fishing” (Pearse, 1991). Pearse proposed that the government protect the public interest by setting out enforceable ground-rules, which he referred to as “conservation prescriptions.” These prescriptions would establish the constraints within which fisheries could be harvested and developed. Pearse’s approach was further developed by the Fisheries Task Force, which released its final report in April 1992. It recommended that new fisheries legislation include a sustainable management purpose similar to that of the RMA. In addition, it recommended that legislation explicitly refer to “adopting an ecosystem based approach” to the management of the marine environment and that environmental standards be set. These recommendations were partly, but not wholly, incorporated into the new Fisheries Act 1996, which provides the current framework for fisheries management in New Zealand.

## Addressing the Environmental Impacts of Fishing Under the Fisheries Act

The New Zealand *Fisheries Act 1996* includes provisions in three parts of the law to address the environmental impacts of fishing. The main provisions are described below.

**Purpose:** The purpose of the Fisheries Act incorporates the concept of sustainable “utilisation,” which is “to provide for the utilisation of fisheries resources while ensuring sustainability” (Section 8(1)). The legislative definitions of the key terms in the purpose statement are wide, with “ensuring sustainability” defined as “maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.” Within this definition, “effects” includes temporary and permanent effects; past, present and future effects; and cumulative effects in addition to low-probability effects with high potential impact. There is no definition of what effects are to be classified as “adverse.” “Aquatic environment” is defined as including “natural and biological resources comprising any aquatic ecosystem,” meaning that adverse impacts on marine ecosystems are to be addressed under the legislation. Finally, as noted in Section 2b, “utilisation” is defined as “conserving” as well as “using, enhancing, and developing fisheries resources” in order to “enable people to provide for their social, economic, and cultural well-being.” This enables factors other than the biological status of fish stock to be considered in decisions, and encourages fisheries management to seek to conserve as well as utilize fisheries resources.

**Environmental principles:** The Fisheries Act 1996 includes a set of environmental principles which decisions made under the Act must “take into account.” These principles include: maintaining the long-term viability of associated or dependent species, defined as “any non-harvested species taken or

otherwise affected by the taking of any harvested species”; maintaining the biological diversity of the aquatic environment, defined as “the variability among living organisms, including diversity within species, between species, and of ecosystems”; and protecting habitat of particular significance for fisheries management.

**Environmental standards:** While there is no explicit legislative provision for environmental standards in the Fisheries Act 1996, the Ministry of Fisheries 1998 Strategic Plan articulated an intention to specify “environmental goals and standards related to the use of fisheries.” This approach was formalised in 2005, with the Ministry’s release of the “Strategy for Managing the Environmental Effects of Fishing.” This document set out a framework for establishing the government-set environmental standards which were to be the key mechanism for defining “acceptable limits of the effects of fishing on the aquatic environment.” As the standards would be non-statutory, the Ministry planned to effect them through Ministerially approved fisheries plans. Although the Ministry undertook work to prepare standards for the incidental capture of seabirds and for addressing the impacts of fishing on benthic environments, the work was never completed. The programme of developing environmental standards was discontinued in 2011 after the Ministry of Fisheries was amalgamated into the Ministry for Primary Industries.

**Information principles:** The Fisheries Act also contains a set of information principles (Section 10) which require that decision-makers take into account the need to base decisions on the “best available information.” This is defined in the Act to mean, “the best information that, in the particular circumstances, is available without unreasonable cost, effort or time,” requiring the decision-maker to be accurately informed as to what

**The purpose of the Fisheries Act incorporates the concept of sustainable “utilisation,” which is “to provide for the utilisation of fisheries resources while ensuring sustainability.”**

information is available, at what cost, and within what time-frame. He or she then has discretion as to whether their decision will be based on the best available information, but they would need a justifiable reason not to use the best information available (New Zealand Federation of Commercial Fishermen & Ors v. The Minister of Fisheries & Ors, 2010). The principles also indicate that any uncertainty in information should be considered, that caution should be applied when information is uncertain, unreliable, or inadequate, and that the absence of, or uncertainty in, any information should not be used as a reason not to take action. These principles have been the subject of frequent judicial review challenges to Ministerial decision-making, on the basis that they were not properly applied.

**Fisheries plans:** The Fisheries Act 1983 made provision for the preparation of regionally-based fisheries management plans through a process of wide public consultation, hearings, and potential public inquiry by the Planning Tribunal (now the Environment Court). These provisions were left unchanged when the 1986 amendments introduced the QMS. The plans were subsequently considered to be inconsistent with the new rights-based management regime and the provisions providing for them were not carried through into the 1996 Act (Walshe, 2010; Pearse, 1991). New, slimmed-down provisions for fisheries plans were introduced into the legislation in 1999. Plans were to include fisheries management objectives, strategies to achieve the objectives, performance criteria, conservation, or fisheries services and contingency strategies to deal with foreseeable variations in circumstances. It was initially envisaged that the plans would be developed by stakeholders, primarily quota owners, who would lead the public consultation process and then submit the plans to the Minister for final approval. The approved fisheries plans were to provide the basis on which fisheries management responsibilities would be devolved to the industry. In 2005, accompanying a policy shift away from devolution, the Ministry of Fisheries took the lead in plan development. Three “proof of concept” plans were initially developed, which were to be followed by a 5-year programme of developing 29 individual plans. Before the programme got real traction, a 2008 change in government



A shoal of maomao fish

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led to a further shift in approach (Bess, 2012). The Ministry for Primary Industries now operates on the basis of 5 high-level fisheries plans (for highly migratory/pelagic fish, deepwater species, shellfish, inshore finfish, and freshwater species), each of which are accompanied by annual operating plans that monitor performance and prioritise the services provided to each fishery.

**Population management plans:** The Fisheries Act 1996 introduced the new strategy of preparing “population management plans” to better manage by-catch of protected species in New Zealand fisheries. Accompanying provisions were inserted into the Marine Mammals Protection Act and Wildlife Act to provide a framework for the preparation of the plans. These provisions were to determine the maximum allowable level of fishing-related mortality for marine mammal and seabird species to ensure that threatened species were able to “achieve non-threatened status as soon as reasonably practicable, and in any event within a period not exceeding 20 years.” In

In addition, they aimed to ensure that fishing-related mortality would not cause other species to experience a “net reduction in the size of the population nor seriously threaten the reproductive capacity of the species” (Section 3F). Once a plan has been approved by the Minister of Conservation, the Fisheries Act requires the Minister of Fisheries to take all reasonable steps to ensure that the maximum allowable fishing-related mortality limit set in the plan is not exceeded (Section 15). Although there have been several attempts to prepare such plans, none have ever been completed. This is due, in part, to political reluctance, as well as to practical difficulties such as the fact that the recovery times for marine mammal species were greater than 20 years. These plans have now been effectively abandoned as management tools.

In the absence of a population management plan, the Minister of Fisheries may take measures he or she considers necessary to “avoid, remedy or mitigate the effect of fishing-related mortality on protected species”; this may include setting a limit on such mortality (Section 15(2)). Such a limit has only been set once, however, in the case of New Zealand sea lion capture in the southern arrow squid fishery.

**Sustainability Measures:** The Fisheries Act 1996 makes broad provision for the Minister of Fisheries to apply controls to fishing activity by regulation. Such measures can include setting the TAC and restricting the size, sex, or biological state of any species taken, as well as prescribing the area from which any species may or may not be harvested, the fishing methods that may or may not be used, and the season when any activity may or may not take place (Section 11). In practice, this results in many controls being placed on fishing activity in addition to the setting of TACs and TACCs. Sustainability measures also allow for finer-grained spatial management than is often possible with the setting of TACs and TACCs on their own. This is because the quota management areas are typically very large; some fisheries, such as hoki, encompass the entire New Zealand EEZ, and some inshore stocks encompass extensive coastlines. Due to the large differences in species’ spatial life cycles, they also rarely coincide with biological stocks.

## CASE STUDY: Setting a Fisheries-Related Mortality Limit for New Zealand Sea Lions in the Arrow Squid Fishery

The New Zealand sea lion is endemic to New Zealand and is classified as nationally critical. Because sea lion foraging areas overlap with the arrow squid trawl fisheries, particularly around the sub-Antarctic Auckland Islands, the animals can drown after becoming trapped in trawl nets. Since 1992, the Minister of Fisheries has set an upper limit on the number of sea lions that can be incidentally drowned in the squid fishery (“fisheries-related mortality limit”), with the most recent number being set at 68 animals. The number of sea lion deaths is estimated by multiplying the number of trawl-net tows by a pre-determined sea lion “strike rate” per tow. When the estimated number of sea lion deaths reaches the limit, the fishery is closed. This has happened during 7 fishing seasons, though two of the closures were successfully challenged by the fishing industry in the High Court. During two additional years, the industry voluntarily withdrew from the fishery once the limit was reached.

Since 2001, Sea Lion Exclusion Devices (SLEDs) have been introduced onto vessels in the fishery in order to allow captured sea lions to escape from the net. The devices have considerably reduced the number of sea lions visibly captured and have likely reduced the number drowned. Still, there remains uncertainty as to whether sea lions drown in the nets and fall out of the SLEDs uncounted, as well as to what the rate of survival is for the animals that escape through the SLED. The adoption of SLEDs resulted in the application of a “discount rate” to the estimated sea lion strike rate per tow (currently set at 82%). Due to the introduction of the SLEDs and the discount rate applied to them, the mortality limit for sea lions has not officially been reached for some years. During the 2014-15 fishing year when 88% of trawl tows were observed, for example, there was only one documented sea lion capture (MPI, 2016a). In 2016, when 91% of tows were observed, no sea lions were captured (Seafood NZ, personal communication).

**Fishing permit moratorium for non-QMS species:** The Fisheries Act 1996 provided for the placing of a moratorium on the issue of fishing licences for a range of listed species and species complexes not brought under the QMS. The moratorium was put into place in 1993 to limit development of these

fisheries before they were considered for introduction. Only permits in existence prior to 1993, if any, were re-issued for these species. Most fisheries listed on this moratorium have now been considered for introduction into the QMS, and the list now contains only 26 species or species complexes. Once a sustainability or utilisation issue arises for the stock, the Minister must decide whether or not to make it subject to the QMS. At that stage, the moratorium on the issue of fishing permits expires, even if the Minister decides to continue to manage the stock outside the QMS.

**Introduction of species into the QMS:** As described earlier, the QMS has changed since its introduction in 1986 from being a mechanism to supplement existing management of the main commercial fisheries (153 stocks covering 26 species) to a comprehensive system incorporating all commercial fisheries requiring management intervention (642 stocks and 98 species or species complexes). Although significant expansion of species subject to QMS management remained some way off in 1996, the QMS at that time became New Zealand's preferred management system under which commercial fishing activities would be managed. This was made clear by the Select Committee when it reported the Bill back to the House, stating in its report, "It is Government policy to bring all commercially harvested species into the QMS." This preference for managing commercial fishing under the QMS was also reflected in the operational definitions and criteria applied by the government when assessing whether a fishery should be introduced into the QMS. Under section 17B of the Fisheries Act 1996, the Minister is required by law to make a determination on whether to make a fishery subject to QMS management if the Minister is satisfied that current management of a fishery is not meeting the purpose of the law; i.e. to ensure sustainability of the stock or species and also provide for its utilization. In essence, rather than being an overlay to other regulatory processes, an explicit decision now must be made as to whether management under the QMS will better meet the purpose of the law than would regulatory (sustainability) measures set under another section of the Fisheries Act 1996 (Section 11). Notably, however, management under

## CASE STUDY: Restrictions on Fishing in the Inner Hauraki Gulf

A 2004 assessment of restrictions on fishing in the inner Hauraki Gulf identified 30 separate provisions. They restricted the type of fishing gear that can be used in various locations, prescribed mesh sizes for nets and dimensions for Danish seine equipment, established minimum harvest sizes for some species, placed prohibitions on the commercial take of a range of shellfish species, and placed a general prohibition on the take of a range of reef species. Somewhat surprisingly, a prohibition on the commercial harvest of scallops during evening hours and over weekends still exists on the books. It states that "No commercial fisher shall take scallops other than 1 hour before sunrise to 1 hour after sunset, but excluding the time from one hour after sunset Thursday to an hour before sunrise on the following Sunday" (Froude & Smith, 2004).

the QMS does not exclude the additional or simultaneous use of such measures. When assessing whether the current, non-QMS management framework is ensuring sustainability, consideration is given to the extent to which the stock is currently being overfished and whether fishing activity is having an adverse effect on the aquatic environment. Applying the utilisation criteria includes considering whether the current framework is inhibiting access to the fishery and/or impeding social, economic, and cultural wellbeing.

## Ecosystems-Based Management

Ecosystem-based fisheries management (EBFM), as articulated in the 2003 FAO technical guideline, focuses on "applying an integrated approach to fisheries within ecologically meaningful boundaries." It emphasises the need to "maintain or improve ecosystem health and productivity to maintain or increase fisheries production..." (FAO, 2003). This can be distinguished from the concept of ecosystems-based management, which has a broader remit and does not place fisheries at the centre of decision-making (Thrush et al., 2016).



A snapper in sunrays

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Neither ecosystems-based management nor EBFM are specifically referred to in New Zealand fisheries legislation and there is no formal government document articulating how such an approach is to be applied to the New Zealand fisheries management system. However, several elements of an EBFM approach are included in the current design of the New Zealand fisheries management system (as described above). For example, the Fisheries Act 1996 requires that species be introduced into the QMS when there is risk of over-harvest under an open-access regime and that harvest levels of QMS species be capped to achieve  $B_{MSY}$  or larger stock size (through the establishment of a TAC and TACC). In addition, the impacts of fishing activity on protected species such as marine mammals and seabirds are considered; more broadly, the Fisheries Act

1996 requires that impacts on the biological diversity of the aquatic environment be considered and that habitat of particular significance for fisheries management should be protected. Some of the responses to these matters are described in Section 6a below. They indicate greater progress on addressing impacts on protected species than on managing broader by-catch, habitat, biodiversity, and ecosystem impacts.

In 2013, a group of MPI-based scientists (Mace et al., 2013) indicated that some Maximum Sustainable Yield (MSY)-related targets are now being considered in an ecosystem context, with consideration given to forage species, by-catch species, discards, protected species, and habitat impacts. For example, in the case of pilchards, which were introduced into the QMS in 2002, they state that the TACC was allocated in recognition of the role pilchard play in the marine ecosystem as a forage species, with actual landings being well below the cap. Research has been undertaken into benthic impacts (described below) and into other aspects of ecosystem structure and function, such as the diets of key commercial fish species, in order to support trophic and food-web modelling and reports on the impact of climate variability on fisheries. However, these broader ecosystem issues have yet to be explicitly incorporated into standard fisheries decision-making processes (Massey, 2005).

The New Zealand government has recently expressed a renewed intention to apply an ecosystems-based approach to fisheries management and to address the impacts of benthic-disturbing fishing methods. The updated Biodiversity Action Plan 2016-2020 sets out a range of ambitious actions with the target that "Biodiversity [be] integrated into the New Zealand fisheries management system." The actions include: "by 2020, New Zealand will have moved towards an ecosystem approach to fisheries management that includes enhanced recording of bycatch from the sea and improved understanding of the rates of change in marine biodiversity" and "by 2020 demonstrable progress will have been made towards managing the impacts of bottom trawling and dredging on the seabed."

## Interface Between the Fisheries Act and Other Legislation

Over the 30 years since the QMS was introduced, there has been growing competition for marine space and resources from a range of activities, including marine conservation, aquaculture, and seabed mining. An effective framework for addressing the interactions and potential conflicts between them remains to be developed, despite a number of attempts. A 1999 report by the Parliamentary Commissioner for the Environment identified several problems with the current management of New Zealand's oceans, as well as a need "for a complete reappraisal of the institutional, legal and knowledge bases with which we manage the marine environment" (Parliamentary Commissioner for the Environment, 1999). This report helped prompt an initiative by Government to establish an Oceans Policy process in 2000. This process did not reach a conclusion, however, coming to a halt in 2003 and leaving the status quo in terms of the interface (or lack thereof) between the various pieces of legislation applying to New Zealand's ocean realm. Figure 11 illustrates the primary pieces of legislation that are central to marine and fisheries management.

### The Fisheries Act and Resources Management Act (RMA)

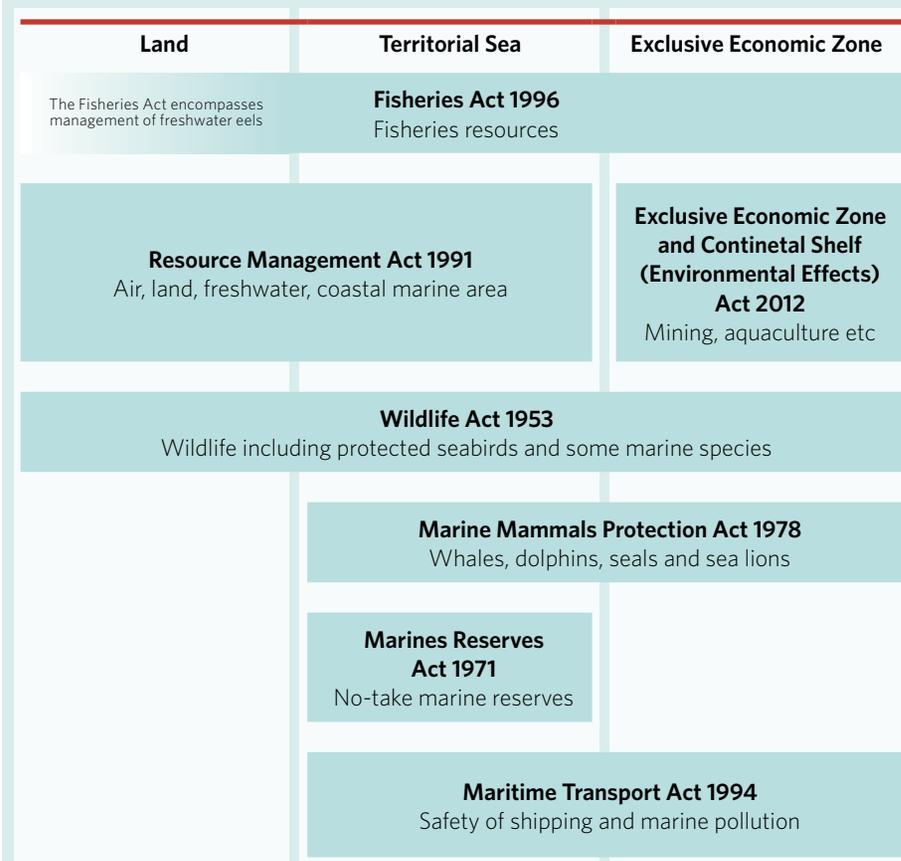
The Fisheries Act 1996 and the RMA are the two key pieces of legislation managing human impacts on the coastal marine environment, so the interface between them is important. There are some key differences between the two Acts (see Table 5). The Fisheries Act focuses on sustainable "utilisation," for example, while the RMA tackles sustainable "management." Another difference is in the presumptions made regarding the activities which affect natural resources. On land, the RMA presumes that activities are allowed unless expressly restricted by a rule in a district plan. The RMA's presumption is reversed for freshwater and the territorial sea, where most activities are not allowed unless expressly

### Section 5:

Fisheries Management within the Wider Context of Ocean Conservation and Management

authorised in a plan or by resource consent. Under the Fisheries Act, a similar presumption applies to commercial fishing, even though it operates under a rights-based system (i.e. commercial fishing cannot take place unless authorised by a fishing permit). Recreational and customary fishing, however, follow the land-based presumption; activities can be undertaken unless expressly restricted through regulations.

**FIGURE 11.** New Zealand Fisheries management within the wider legislative framework as of 2017



**TABLE 5.** Comparison of key elements of the Fisheries Act 1996 and the Resources Management Act

Element	Fisheries Act 1996	Resources Management Act (RMA)
Purpose	Sustainable utilisation	Sustainable management
Policy and Plans	Fisheries Plans	National Policy Statements, National Environmental Standards, Regional Policy Statements, Regional Plans, Regional Coastal Plans, District Plans
Public Participation	Stakeholders are consulted (usually through a written submission process), with no right of appeal	Broad public submission, hearings, and merit-appeal rights are submitted to special Environment Court
Decision-Making	Decisions are made by the Minister	First-instance decisions are made by district or regional politicians (or by independent commissioners);  Second-instance decisions on merit appeal are made by the independent Environment Court
Presumptions	Commercial fishing cannot take place without a fishing permit;  Customary and recreational fishing can take place unless restricted by regulation	Most activities on land can take place unless excluded by a rule in a plan;  Most activities in freshwater and the marine environment cannot take place unless authorised by a rule in a plan or by resource consent

The interface between the Fisheries Act and the RMA was a matter that was given careful consideration during the legislative process. On the face of it, there is potential for considerable overlap between them when it comes to managing the environmental impacts of fishing within the territorial sea. Under the Fisheries Act, the Minister is empowered to restrict fishing activity for the purpose of “avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment” (Section 8(2b)). Under the RMA, regional councils have a range

of functions to control activities in the territorial sea including “the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity” (Section 30(1ga)), with such methods able to include rules in regional coastal plans.

There are two key elements to this interface that are significant to fisheries management. The first is the extent to which the environmental impacts of fishing can be managed under the RMA. The second is the extent to which the RMA system effectively manages the impact of land-based activities on habitats of significance to fisheries.

## How the Resources Management Act Addresses Fishing and Its Impacts, and How the Fisheries Act Influences Regional Plans

Both the Fisheries Act 1996 and the Resources Management Act (RMA) explicitly deal with their interface when it comes to fisheries matters. Section 6 of the Fisheries Act establishes that regional plans (or coastal permits issued under the RMA) may not explicitly allocate fisheries between different sectors. This makes it clear, for example, that a regional council could not establish a recreational fishing park by excluding commercial fishers from part of a coastal marine area. Conversely, section 30(2) of the RMA makes it clear that regional councils may not undertake certain measures “for the purpose of managing fishing or fisheries resources controlled under the Fisheries Act 1996.”

Although Regional Councils potentially have the power to manage the environmental impacts of fishing activity, it is only recently that some have sought to do so (see “Case Study” below). In another recent example, the Marlborough District Council proposed the Marlborough Environment Plan (notified in June 2016), seeking for the first time to protect significant marine sites in the Marlborough Sounds from the impacts of fishing gear such as trawling and dredging. These provisions have yet to be tested through the hearings and appeals processes.

## Management of Land-Based Impacts on Habitats of Importance to Fisheries

Land-based activities (in addition to fishing-related benthic-disturbance) can and do significantly impact habitats of importance to fisheries, particularly coastal habitats such as shellfish, bryozoan, and seagrass beds which provide nurseries for juvenile fish. The most damaging substances are typically sediment, nutrients, and other contaminants such as heavy metals. Excess sedimentation, along with excess nutrients carried down waterways, was recently identified as among the most important coastal pressures causing degraded coastal ecosystems (Ministry for the Environment & Statistics New Zealand, 2016). Such loss of habitat is thought to impact juvenile fish

production (as described in Section 6a below), but has yet to be explicitly factored into stock assessments. Plans prepared by Regional Councils under the Resources Management Act could address these impacts. But, to date, they have not adequately done so despite the fact that there is legislative provision for fisheries management considerations to influence management under the RMA. When preparing RMA planning documents, Councils are required to have regard for fisheries regulations, as well as for management plans and strategies prepared under other Acts, such as the Fisheries Act (section 66(2c)). The development of policy statements and plans under the RMA normally go through a full public submission and appeal process (RMA, Schedule 1), potentially enabling fishing industry entities and the MPI to make submissions in favour

### CASE STUDY: Bay of Plenty Council Actions to Protect Marine Area Around Otaita (Astrolabe) Reef

In October 2011, a container ship and cargo vessel named the *MV Rena* grounded on the Astrolabe Reef, resulting in a major oil spill and the loss of containers and cargo. In the wake of the grounding, a two-nautical mile navigation exclusion zone was placed around the reef, effectively prohibiting fishing activity in the area for five years. With the removal of fishing pressure from the reef, the abundance of marine life in the area started to noticeably increase. The exclusion zone was uplifted in April 2016 when salvage work had been completed, and fishing activity recommenced.

When faced with the imminent uplift of the exclusion zone, the Motiti Rohe Moana Trust applied to the Ministry for Primary Industries under the Fisheries Act for a temporary closure, or *rāhui*, to protect the recovering marine life on the reef. However, they did not receive

a response before fishing recommenced. Concerned that heavy fishing was once again stripping the reef of key species, the Trust applied to the Environment Court for a declaration that it was lawful for the Bay of Plenty Regional Council, through provisions in its regional coastal plan, to spatially protect parts of the marine environment from the impacts of fishing activity.

The Court concluded that the council was able to provide such protections so long as the sole or dominant purpose was related to those set out under the RMA, such as having particular regard to the intrinsic values of ecosystems or the relationship of the Māori to ancestral waters and taonga. The Court stated, “we are satisfied that the Resource Management Act and the Fisheries Act are intended to work in tandem, and that ... both Acts are aware of,

and attentive to, the other” (The Trustees of the Motiti Rohe Moana Trust v. Bay of Plenty Regional Council, 2016). On appeal, the High Court reached a similar, but slightly more nuanced conclusion, holding that councils may not use specified functions to “regulate fishing for the purpose of managing the utilisation of fisheries resources or the effects of fishing on the biological sustainability of the aquatic environment as a resource for fishing needs.” However, they continued that “this does not prevent councils from exercising functions to control, when necessary, other or externalities of fishing activity on the environment as defined by the RMA” (Attorney-General v. The Trustees of the Motiti Rohe Moana Trust, 2017). This decision is now subject to further appeal to the Court of Appeal, so the relationship between the RMA and the Fisheries Act has yet to be fully settled.

### CASE STUDY: Protection of Important Fish Habitat

The Auckland Unitary Plan is a combined RMA policy-statement, regional, and district plan that applies to the Auckland region, including many habitats of importance to fisheries. The Kaipara Harbour, for example, whose southern half falls within the Auckland region, is thought to be the source of the entire North Island west coast snapper fishery. The Hauraki Gulf, much of which also falls within the Auckland region, is the major spawning and nursery area for the east coast snapper stock. However, while the proposed Auckland Unitary Plan, which was notified in September 2013, identified numerous ecologically important areas such as shorebird roosting and wading sites, it provided little protection for habitats of importance to fisheries and did not specifically identify important fish habitat. In addition, its provisions for controlling excess sedimentation entering the marine environment were generally weak. Forest harvesting, for example, was an activity it permitted. Although the Ministry for Primary Industries lodged a submission on the proposed Plan, it only addressed aquaculture (seeking more flexible re-consenting provisions), forestry (seeking more flexible provisions for forestry), and biosecurity, with no mention made of the need to protect important fish habitat. Of the major fisheries interests in the Auckland region, including all companies and representative entities, only Sanford Limited lodged a submission on the proposed plan. Yet even its submission focused largely on aquaculture issues and made no mention of protecting fish habitat.

of more restrictive measures on land uses to reduce impacts on the marine environment. However, making submissions on plans and resource consents is a resource-intensive process with uncertain outcomes, and can therefore be off-putting for fisheries interests. In addition, MPI has not routinely and actively engaged with RMA planning provisions to protect habitat important to fisheries.

## Spatial Conflict Between Fishing and Marine Protection

### Marine Reserves Act of 1971

When the QMS was first introduced in 1986, there were only 2 marine reserves designated under the Marine Reserves Act 1971 and a further 2 marine parks established under other legislation. The relatively small and localised extent of marine protection was likely one of the reasons why the interface between the QMS and marine protected areas was not given considered attention when the QMS was first introduced. But this situation has since radically changed. Currently there are 44 no-take marine reserves in place throughout New Zealand's territorial sea, collectively totalling 17,430 km<sup>2</sup> (around 10% of the area). Much of the protected space is around the remote Kermadec and Sub-Antarctic Island groups, rather than along the mainland coast. More marine reserves have been recommended by collaborative processes (see DoC's 2015 [map of marine protected areas](#)). Although the impacts on fishers are considered when the decision to create a marine reserve is undertaken (the reserve cannot be created if it would "interfere unduly" with commercial or recreational fishing), no compensation is provided for affected fishers and there is no provision made for the retirement of quota for species previously commercially fished in the area.

In 2005, the Department of Conservation and the Ministry of Fisheries released a policy statement and implementation plan for marine protected areas. It was designed to provide a more strategic approach for identifying and creating a network of representative marine protected areas. It identified three types of protected area: Type 1 encompasses high-protection areas such as a no-take marine reserve; Type 2 refers to limited-protection areas that, at a minimum, prohibit trawling, Danish seining, and dredging; and Type 3 areas are those that are relevant for measuring progress towards New Zealand's

biodiversity target but which do not sufficiently protect biodiversity to meet the Type 1 or 2 standard (DoC and Ministry of Fisheries, 2005). Biogeographic regions have been identified, and these are the focus of community-based planning processes to identify candidate marine protected areas. The planning processes are undertaken by representatives from tangata whenua, commercial fishers, recreational users, the aquaculture and minerals industry, and environmental groups. More recently, in 2016, the government released a consultation document on new legislation for marine protected areas, but it has yet to be introduced to Parliament (MfE, 2016).

## Marine Mammals Act

The Marine Mammals Protection Act 1978 has expanded the number of marine mammal sanctuaries created in New Zealand. The first sanctuary was established around Banks Peninsula in 1988, extending over 1,140 km<sup>2</sup> to protect the endangered Hector's dolphin. This was followed in 1993 by a 4,840-km<sup>2</sup> marine mammal sanctuary established around the Auckland Islands to protect the New Zealand sea lion and the southern right whales which breed there. In 2003, this area was also declared a marine reserve. By 2017, there were 6 marine mammal sanctuaries around the coast, covering some 32,418 km<sup>2</sup>.

Marine mammal sanctuaries in themselves do not constrain fishing activities. However, restrictions on activities can be defined when a sanctuary is declared. In addition, regulations under the Fisheries Act can and have been used to restrict specific fishing activity within all or part of sanctuary boundaries. In the sanctuaries protecting Hector's and Māui dolphins, the focus has been on excluding set netting (and trawling, to a lesser extent) from a portion of the dolphin's habitat, as these activities were identified as creating the greatest risks for the dolphins. The Māui dolphin population appears to have stabilised since the protections were put in place, albeit it at a very small number of around 63 adults.

## CASE STUDY: Kermadec Ocean Sanctuary Proposal

In September 2015, the New Zealand Prime Minister at the time, John Key, announced the government's intention to create a large, no-take marine sanctuary around the Kermadec Islands comprising 620,000 km<sup>2</sup>. This decision was made on the basis that the Kermadec marine area was one of the most pristine and unique environments in the world, supporting some 6 million seabirds, over 150 species of fish, 35 species of whales and dolphins, 3 species of endangered sea turtles and a range of other marine species unique to the area. The Kermadec's area comprised the entire FMA10, and the government estimated that around 20 mt of highly migratory fish were caught there annually with a total value of about \$165,000 NZD. As the species were migratory and the Individual Transferable Quota was not specific to FMA10, the government concluded that the fish could be caught elsewhere in New Zealand's water and that fishing interests would therefore not be significantly impacted by the establishment of the sanctuary. No compensation for affected quota owners was proposed. A [Bill to create the sanctuary](#) was introduced to Parliament in March 2016.

The ambitious proposal brought the unresolved interface between the ITQ, the Māori Fisheries Settlement,

and spatial marine protection to a head. Separate legal proceedings were lodged by Te Ohu Kaimoana, a consortium of commercial fishing interests, and two individual tribal authorities: Te Whānau a Apanui and Ngāti Mutunga o Wharekauri. These proceedings challenged the government's decision to create the sanctuary. Te Ohu Kaimoana opposed the proposal on several grounds, including that it undermined the integrity of the Māori Fisheries Settlement and the QMS, it was a breach of the Crown's obligation under the Treaty of Waitangi to act in good faith, and it extinguished property rights without consent or compensation (TOKM, 2016). They claimed that the impact of the closure was far greater than the government had stated, both because it undermines the integrity of the settlement and because it stops further development and allocation of QMS and non-QMS fisheries. Negotiations were initiated between the parties, but a resolution has yet to be achieved. Meanwhile, progress of the sanctuary bill through the house has ceased.

## Benthic Protection Areas

New Zealand does not currently have legislation providing for the creation of marine reserves in its exclusive economic zone (EEZ), as the application of the Marine Reserves Act is

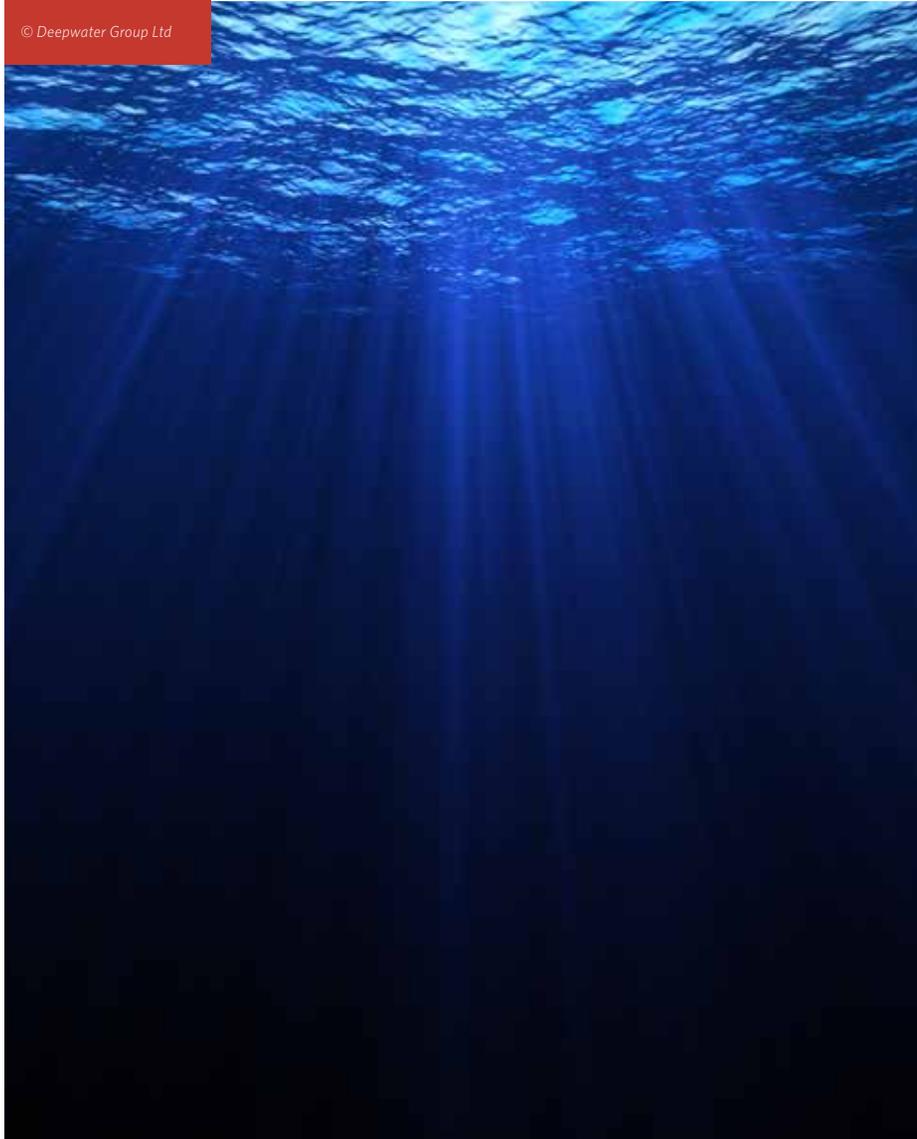
*Light shining into  
New Zealand waters*

© Deepwater Group Ltd

confined to the territorial sea. In 2005, largely in response to concerns about the impacts of bottom trawling on benthic communities, the Deepwater Group (a company representing the owners of around 95% of quota held in New Zealand's deepwater and mid-depth fisheries) proposed to the government that it establish a series of Benthic Protection Areas (BPAs) where deepwater bottom trawling and dredging would be prohibited (Deepwater Group, 2015).

The initial proposal was to protect 14 areas which had not been fished, covering 31% of the EEZ. After considering the initial proposal, the Minister of Fisheries requested that the Deepwater Group amend the delineation of the specified areas to increase their representativeness. This resulted in a revised proposal which was put out for public consultation. As a result of public submissions, three additional areas were included in the protection package. The protected areas now include 28% of underwater topographic features (including seamounts), 52% of seamounts (underwater mountains over 1,000 metres in height), and 88% of active hydrothermal vents within New Zealand's EEZ. As much as 82% of the protected area is currently too deep to be trawled (using today's technology), so only around 16.6% of trawlable depths in the EEZ are protected (Leathwick et al., 2008; Riser et al., 2013).

The initial proposal was offered by the Deepwater Group on the basis that the establishment of the Benthic Protection Areas would be sufficient to fully avoid, remedy, or mitigate the impacts of fishing on the benthic environment as required under the Fisheries Act. It thereby hoped to avoid the imposition of further closures. To this end, its proposition was only partly accepted by the government, which agreed that no further marine protection measures would be implemented prior to 2013. As part of the proposal, the fishing industry also sought to be relieved of any further costs of research into the potential impacts of bottom trawling, but this, too, was only partially accepted. The government agreed that two thirds of future research into this issue would be government-funded, but the remaining third was to be levied against quota holders (Helson et al., 2010).



## Spatial Conflict Between Fishing and Aquaculture

The current regulatory framework requires that proposed marine farm applications be assessed by the Ministry for Primary Industries to identify if there are “undue adverse effects” on commercial, recreational, and customary fishing. Such an assessment includes consideration of the likely effect on fishing, the extent to which fishing for that species could occur in other areas, the extent to which the proposal would increase the cost of fishing, and the cumulative effect of aquaculture on

fishing (Fisheries Act 1986, Section 186GB.). If “undue adverse effects” are identified, the proposal may not proceed unless an agreement is reached through negotiation or arbitration for the proponent to compensate the affected quota owners.

Aquaculture in New Zealand was first developed during the 1960s. It was only after the QMS was introduced that aquaculture underwent a large expansion phase, beginning in the 1990s. Siting issues, which the Resources Management Act was not well equipped to address, became intense during this period. In 2002, a moratorium was issued on processing aquaculture consents; it was not lifted until a more restrictive regime for siting was put in place in 2004. Māori claims to aquaculture were settled at the same time under the Māori Commercial Aquaculture Claims Settlement Act 2004, which included an agreement that iwi would be allocated 20% of any new space in which aquaculture would be permitted. Further reforms were passed in 2011, designed to loosen up the regulatory regime and enable more space to be allocated to aquaculture. This was in line with the government's goal to assist the sector to double its revenue in sales by 2025 to reach \$1 billion NZD. In 2016, there were 1,189 consented marine farms occupying over 100 km<sup>2</sup>; almost half of these were located within the Marlborough region. Iwi and fishing industry companies have a growing ownership stake in the industry.

## Spatial Conflict Between Fishing and Seabed Mining

In 2012, the major gap in New Zealand's environmental legislation covering the marine area was closed with the passage of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act. One impetus for the legislation was a growing interest in seabed mining. The legislation, which came into force in June 2013, established a consenting regime for a range of activities, including petroleum and minerals exploration and production, aquaculture, marine energy generation, and carbon capture and storage. The act explicitly does not apply to fishing activity or shipping. The consenting regime

### CASE STUDY: Chatham Rock Phosphate Deep-Sea Mining Proposal

In June 2014, Chatham Rock Phosphate Limited applied for a marine consent to mine phosphate over a 10,192 km<sup>2</sup> area located on the Chatham Rise (the application was later reduced to 5,207 km<sup>2</sup>). The Rise is one of the most productive marine areas in New Zealand and supports important deepwater fisheries. About half of the proposed mining area overlapped with 60% of a Benthic Protection Area (BPA) which had been closed to bottom trawling to protect seabed habitat (the overlap area was comprised of 5,236 km<sup>2</sup>). As the BPA had been created under Fisheries Act regulations, its exclusions did not apply to other activities such as mining. The mining activity would have the effect of completely removing the upper layer of the seabed and all resident benthic marine life, including rare cold-water corals, thereby negating the benefit of the BPA. Other potential impacts on marine life (and potentially, therefore, on fishing) included increased suspended sediment, changes in water quality, and noise.

The proposal was ultimately declined by the Environmental Protection Authority on a range of grounds, including the likely destruction of the rare and vulnerable stony coral communities which were potentially unique to the area, impacts on the BPA which would compromise its integrity, and uncertainty as to the environmental impacts of the proposal due to its reliance on a model that had not been validated (Environmental Protection Authority, 2015). The threat of seabed mining to the BPA highlights the need for more comprehensive marine protection tools applying to all activities within the EEZ.

is administered by New Zealand's Environmental Protection Authority. The act's decision-making criteria include a wide range of considerations, including the protection of biological diversity, rare and vulnerable ecosystems, and habitats of threatened species. Decisions must also take into account the effects on "existing interests of other activities undertaken in the area covered by the application or in its vicinity..." (Section 59(2)), which could potentially apply to existing commercial fishing rights. To date, the two applications made for mining consent under this act have been declined, though a second, amended application was recently granted for one of the activities (mining iron-sands off the Taranaki coast).

## Fisheries Management and Regional Initiatives

Concerns about the state of the marine environment and the lack of integrated management has led to several regional initiatives with significance for fisheries management, including



those in the Hauraki Gulf (see "Case Study" below), Fiordland, and Kaikōura. In the Hauraki Gulf, tailor-made regional legislation overlays the Fisheries Act, placing requirements on fisheries decision-makers to consider an additional range of factors when reaching decisions. In all these localities, non-statutory, collaborative processes have resulted in agreements amongst stakeholders (including commercial and recreational fishers) to provide additional marine protection and control over fishing activity. The outcomes have been implemented through special legislation, as well as regulations promulgated under the Fisheries Act.

### CASE STUDY: Hauraki Gulf Marine Spatial Planning

In 2000, a Hauraki Gulf Marine Park was established on the north-east coast, extending over 13,900 km<sup>2</sup>. The Park includes the seabed, seawater, coastal and island reserves, and conservation land. The Park has several purposes, including to recognise and protect the area's international and national significance, to recognise the special relationship of tangata whenua with the park's marine environment, and to sustain its life-supporting capacity. The legislation places no explicit restrictions on any activity within Hauraki Gulf, but a common set of management objectives, such as those of the Fisheries Act 1996, apply to statutory decision-making. These objectives emphasise the protection and, where appropriate, enhancement of the Hauraki

Gulf's natural, historic, and physical resources (Hauraki Gulf Marine Park Act 2000, Sections 7, 8, & 33).

The legislation also established a new entity, the Hauraki Gulf Forum, to oversee the management of the Hauraki Gulf and its catchments. The Forum was conceived as an integrating, rather than regulatory, body, and it brought the myriad national and local agencies (including the Ministry of Fisheries) together with tangata whenua representatives. The Forum, along with the Environmental Defence Society, were the prime initiators of the Sea Change Tai Timu Tai Pari process to develop a marine spatial plan for Hauraki Gulf aimed at reversing the ongoing environmental decline of the marine system (Hauraki Gulf Forum, 2011).

The plan was developed through a stakeholder-led collaborative process that included iwi, recreational and commercial fishers, marine farmers, dairy farmers, and environmental and community representatives. It was released in December 2016 with far-reaching recommendations for fisheries management within the Gulf. These recommendations include creating a separate Fisheries Management Area for the Park, transitioning benthic-disturbing fishing gear out of the area, and establishing a multi-stakeholder group to make recommendations to the Minister on fisheries-related decisions going forward (Sea Change Tai Timu Tai Pari, 2016). The government is currently considering the plan provisions.

# Outcomes Achieved Under the New Zealand Quota Management System

## SECTION 6

# Outcomes Achieved Under the New Zealand Quota Management System



## Section 6a: Biological and Environmental Performance

Multiple international studies have ranked the New Zealand Quota Management System and its management of particular fish stocks against a range of global indicators. While each study has had a somewhat different framing, New Zealand's rankings in all of these studies has consistently been at the higher end compared to other countries. New Zealand scored amongst the highest of 53 countries analysed in an evaluation of compliance with Article 7 (Fisheries Management) of the Food and Agriculture Organization's Code of Conduct for Responsible Fisheries, for example, which covered six fields of fisheries management (Varkey et al., 2006). A 2009 study

that surveyed fisheries experts to assess the effectiveness of fisheries management regimes worldwide similarly found that New Zealand ranked among the highest in terms of the prospects of fisheries sustainability and the overall effectiveness of management (Mora et al., 2009). A 2017 study surveying experts to characterize the management systems of 28 major fishing nations also had similar findings, ranking New Zealand fifth in overall effectiveness of management systems at meeting objectives (Melnychuk et al., 2017a), although the methodology and conclusions regarding the New Zealand ranking have been questioned (Melnychuk et al., 2017b; Slooten et al., 2017). Individual fisheries managed under the QMS have also received high rankings from international studies. Fishery Performance Indicators, which use 68 individual outcome metrics to assess the performance of individual fisheries, ranked New Zealand's hoki fishery among the highest of the 61 ranked fisheries (Anderson et al., 2015). As of 2017, six mid-depth and

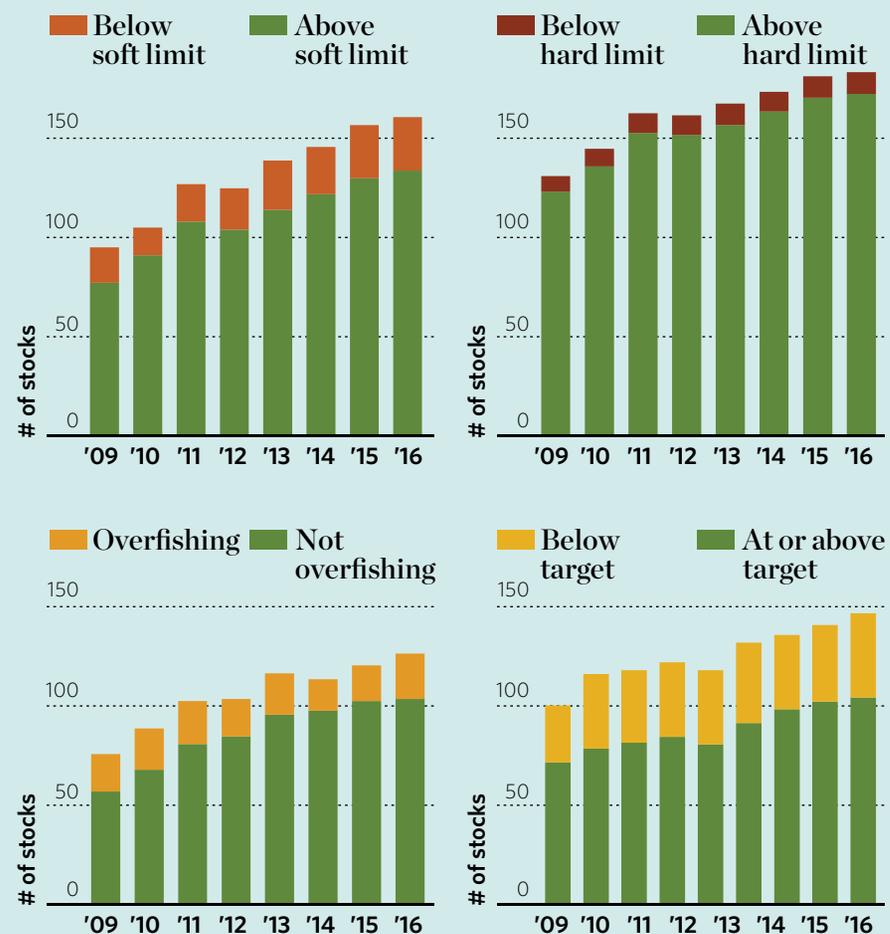
deepwater fisheries in New Zealand are certified by the Marine Stewardship Council. New Zealand's hoki fishery was among the first major fishery in the world to be certified sustainable by the Marine Stewardship Council (MSC). No inshore fisheries in New Zealand have been assessed against the MSC standard.

There is also a body of literature that is critical of the the New Zealand QMS system. This includes criticism regarding the lack of coherent fisheries management objectives, insufficient research investment, and the existence of incentives which keep research funding low (McKoy, 2006). Critical literature also suggests that a paucity of research and assessment information has led to inertia in changing TACs (Mace et al., 2014) and that a failure to collect independent scientific data and undertake formal stock assessments for many stocks has produced inadequate data on ecological impacts for most fisheries (Slooten et al., 2017). In addition, critics of the New Zealand QMS have suggested that it lacks capacity due to personnel loss and the loss of experience and institutional knowledge within the Ministry for Primary Industries (Bess, 2012). Finally, they argue that the QMS has created a rent-based system which incentivises "dominant actors to maximise low value-added extractive activity, often in very wasteful ways" (Torkington, 2016).

## Current Status of New Zealand's Fish Stocks

The New Zealand Ministry for Primary Industries (MPI) reports annually on the status of New Zealand's fish stocks. The "bar" against which stock status is reported is the Harvest Strategy Standard that was finalised in 2008 (see Section 2b). In 2016, the last year for which the MPI's data are available, the status of only around half of the 350 active stocks (a number excluding the 292 nominal stocks which are not actively fished) could be assessed against soft and hard limits, such as the extent of overfishing and/or their relationship to a management target. Of the 150 or so stocks which were assessed,

**FIGURE 12.** Stock and fishery status by number of stocks, 2008-16



83% were above the "soft" limit, 94% were above their hard limit, 18% were experiencing over-fishing, and 29% had biomass below their management target (see Figure 12).

When the same measures are applied to total weight by landing, about two thirds (300,000 mt) of the approximately



Mangroves in  
Mahurangi

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450,000 mt of fish harvested each year comes from fisheries which have been assessed. Of this quantity, 99% of the total assessed harvest is from stocks thought to be above the hard limits, 97% above their soft limits, and only 6% of the total assessed landings are from fisheries that are overfished. It is important to remember when viewing these numbers that when reporting “stock status” by stock, small stocks have a large influence on the number while high-volume deepwater fisheries dominate the statistics when reporting by landings. In addition, it is not possible to determine what the impact of the QMS has been for the stocks which are not assessed (around 50%, or 33% of the total harvest). [MPI annually reports](#) on the status and trends for New Zealand’s fisheries by both “stock” and “landings,” as well as by individual stock..

MPI does not routinely report on the ecosystem impacts of fishing, however, and this gap in reporting has been a source of controversy between MPI and some segments of New Zealand’s academic and environmental communities (Slooten et al., 2017). The Ministry for the Environment and Statistics New Zealand prepare a triannual report on the marine environment as part of their national, state-of-the-art reporting. The 2016 report states that the full ecological impacts of fishing are not clear. The report goes on to say, “Fishing is a highly

valued economic, cultural, and recreational activity and one of the most important issues for which we did not have sufficient data. In particular, we were not able to draw firm conclusions about the full ecological impacts of commercial, recreational, and customary fishing on coastal and open ocean ecosystems” (Ministry for the Environment & Statistics New Zealand, 2016).

## The Importance of Habitat for Fish Production

Most New Zealand coastal waters less than 200 metres deep are important for spawning, for the juveniles of one or more coastal fish species, or for the juveniles of some deeper-spawning species (Hurst et al., 2000). Research has indicated that biogenic habitats (those formed by plants and animals) are especially important for fish that live on or near the bottom of the sea. Biogenic habitats include salt marshes, mangrove forests, seagrass meadows, kelp forests, bryozoan fields, and shellfish beds. These habitats underpin fisheries production for a range of species by providing shelter from predation, access to food sources, and, in some cases, surfaces for reproduction (Morrison et al., 2014a; Spalding et al., 2016).

Biogenic habitats have been affected by land-based stressors, the most important of which is sedimentation, and by mobile fishing gear, which can damage or simply remove habitat. High levels of sedimentation into the marine area can have a range of negative impacts on marine species, including clogging the gills of filter feeders and decreasing their filtering efficiency, reducing the foraging abilities of finfish, and reducing the extent of important nursery habitats (Morrison et al., 2009). For example, major declines in the scallop populations in Golden and Tasman Bays, as well as reduced productivity of the fishery, appear likely to have been influenced by the reduced suitability of benthic habitats for scallop settlement and juvenile survival caused by dredging on historical sediment depositions (Williams et al., 2014).

## The Coastal Habitat / Fish Production Link

Many habitats generate fish or enhance fish populations. Production can and does vary across habitats, space, and even across time. This relationship is recognized in the Fisheries Act through the requirement that decision-makers take into account the principle that "habitat of particular significance for fisheries management should be protected" (Section 9c). The Fisheries Act assumes that this can be achieved, in terms of the impacts of fishing activity such as dredging and trawling on fish habitat, through the deployment of sustainability measures. Regional Councils are charged with addressing sediment and a range of other impacts on marine habitats. Habitats of critical importance to inshore fisheries include the following:

**Sub-tidal seagrass beds:** sub-tidal seagrass beds provide important settlement habitat for fish larvae and support high densities of juvenile fish from species such as snapper, trevally, and parore. There has been a significant decline in seagrass bed abundance in New Zealand over the past 100 years, likely due to increased sedimentation, although historical losses have been poorly documented. Some recent documented examples of loss are in the Whangarei Harbour, where 12-14 km<sup>2</sup> of seagrass beds disappeared after 5 million mt of sediment was dumped

into the estuary in the 1960s during a port expansion project that included a cement works. Between 1959 and 1996, 34% of the seagrass beds in Tauranga harbour were lost, and 97% of beds were lost in the inner Bay of Islands near Rawhiti between 1961 and 2005. These losses have almost certainly reduced juvenile fish production (Morrison et al., 2014a). Recently, there have been small recoveries of seagrass in some areas and successful restoration efforts in other areas, such as the Whangarei harbour where transplant trials of intertidal patches have proved successful.

**Mussel beds:** Green-lipped and horse mussel beds were once extensive on soft sediments throughout New Zealand. Most of the green-lipped mussel beds have been fished to local extinction and the mussels are now mainly confined to rocky reefs. Horse mussels were likely lost to sedimentation and bottom disturbance caused by trawling, dredging, and boat anchoring. Historically, in some fishing grounds, fishers reported that chains were towed between vessels in order to remove the horse mussel beds and "condition" the fishing grounds for trawling in the future. The loss of these once extensive beds has likely had significant implications for fisheries production. Green-lipped mussel beds are known to support densities of juvenile fish that are up to 10 times greater than

### CASE STUDY:

## Kaipara Harbour

The Kaipara is New Zealand's largest harbour and is one of the largest estuaries in the world, covering 734 km<sup>2</sup> with 3,000 km of coastline. An explicit link between biogenic habitat and juveniles has been found in the Kaipara harbour, where the only remaining example of extensive subtidal seagrass meadows can be found on New Zealand's west coast. The harbour supports the majority of recruits into the important west coast snapper fishery and also produces large numbers of juvenile rig (a small shark species) (Francis et al., 2012; Morrison et al., 2014b). Degradation, or loss of habitat, has likely reduced the ability of fisheries to sustain or recover from heavy fishing pressure due to a loss of productivity. The Kaipara harbour is under increasing pressure from land-based impacts, particularly accelerated

densities supported by bare sediments. They also support invertebrates at densities that are 2 to 8 times greater, which is significant because the majority are crustaceans, the dominant food source for small fish. Horse mussel beds are important nursery areas for snapper, trevally, and possibly terakihi in southern New Zealand, and both green-lipped and Horse mussel beds are associated with higher densities of adult snapper. So the loss of mussel beds has likely cascaded



Green-lipped mussel bed

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sedimentation, and subtidal seagrass beds have been lost. As a result, the harbour's capacity to support fish production has likely reduced. The flatfish stock appears to be reducing, with the Catch Per Unit Effort (CPUE) being in decline since the mid-1990s (with one short-lived rebound in the late 2000s), and catches are now at their lowest levels since the early 1970s (Francis et al., 2012; Ministry for Fisheries, 2016; Morrison et al., 2014b).

into a significant reduction in the production of fish such as snapper. It has also almost certainly affected water quality with the filtration potential of the mussels lost (Morrison et al., 2014a). There are multiple efforts beginning in New Zealand to restore lost mussel beds. For example, an effort is underway to begin restoring the 500 km<sup>2</sup> of green-lipped mussel beds lost from the Hauraki Gulf ([www.reviveour-gulf.org.nz](http://www.reviveour-gulf.org.nz)).

## Environmental Impacts of Fishing Under the Quota Management System

Although the impacts of fishing on the broader ocean ecosystem were likely extensive prior to the introduction of the QMS, they were not well recorded at the time. While the introduction of the QMS resulted in the reduction of fishing efforts in some nearshore areas, it remains unclear whether this has reduced any direct environmental impacts from fishing because the possibility has not been investigated or quantified. The QMS is based on species-by-species management, and fishing under this regime can and does also impact non-QMS species and the ecosystem in which fishing occurs. There is a growing body of research on the range of impacts of fishing on New Zealand's marine environment since the QMS was introduced (see MPI, 2016a), but the cumulative effects of these multiple impacts on marine ecosystems, over time, has yet to be effectively assessed or quantified. Data on some of the specific impacts of fishing on the environment and non-target species, which is only available for more recent years, is presented in the graphs below. Specific research and data on non-target species are relatively sparse compared to information on target species, with an even greater paucity of data on ecosystem impacts.

Under the QMS, fishers utilize a range of different gear types and harvest strategies, each with their own consequences for non-target species and ecosystems. Below, we describe some of the regulatory and voluntary management approaches and measures that Government and industry have adopted in an effort to reduce some of the specific environmental impacts of fishing.

### Incidental Fish and Invertebrate By-catch

How by-catch is managed and accounted for under the QMS is described in Section 2c. In this section, we focus on the impacts of by-catch. The proportion of the catch and total amount of incidental catch varies greatly by fishery, with fisheries such as scampi having high levels of incidental catch while fisheries such as southern blue whiting have virtually

no incidental catch of other species. Since by-catch of species managed under the QMS is required to be reported and counted against an Annual Catch Entitlement (ACE) allocation, the by-catch of QMS species on the stock is accounted for and managed. Incidental catch of non-QMS species is also required to be recorded, but the impacts of harvest on these stocks is often not known.

**FIGURE 13.** The estimated fish and invertebrate by-catch in deepwater fisheries, 1991-2012



Source: Ministry for Primary Industries

### CASE STUDY: Incidental Catch in the Scampi Fishery

The incidental catch of non-QMS species is significant in the scampi trawl fishery: for two stocks (SCI 2 and 3) the non-QMS is about equal in weight to the QMS harvest, while for two other stocks (SCI3 and 6A) the non-QMS by-catch is double. This incidental catch consists of 485 recorded species, dominated by sea perch, rattails, spiny dogfish, skates, crabs, toadfish, and flatheads (MPI Fisheries Assessment Plenary, 2016). From the 2004-05 fishing year onwards, modifications were made to the top of the trawl nets, which appears to have had the positive effect of significantly reducing by-catch of QMS species in this fishery. At the same time, however, total discard amounts have not reduced, largely due to a similar reduction not being achieved in non-QMS species by-catch, with discards of invertebrates and rattails increasing significantly over the same period (Tuck, 2015). The impact of the loss of these non-QMS species (which have no harvest limit), is not known.

Relatively detailed information on by-catch is available for several important New Zealand fisheries. For deepwater fisheries, data on by-catch has been collected since 1991, with the latest figures available for the 2013-14 fishing year. Analysis of by-catch levels and trends has been undertaken for 7 trawl fisheries and one longline fishery. As indicated in Figure 13, the total by-catch for the large hoki/hake/ling fisheries, while still substantial, has decreased significantly over time even as overall by-catch has increased since 2012 (Anderson, 2017).

#### Protected Species By-catch

The Conservation Services Programme, which was established in 1995, undertakes research into the adverse effects of commercial fishing on protected species and measures to mitigate them. It applies to species protected under the Marine Mammals Act 1998 and Wildlife Act 1853, which include all

marine mammals, all seabirds (except black-backed gulls), all marine reptiles, many deepwater corals, and nine species of fish, including some shark, ray, and grouper species (DoC, 2015).

The programme is managed by the Department of Conservation and currently funds a varied programme of work, including an annual observer programme (undertaken by MPI observers on fishing vessels), identification of by-caught protected species, population research on various protected species (including seabirds and the New Zealand sea lion), and seabird by-catch mitigation on small vessels (Hjorvarsdottir, 2016). A large proportion of the costs of the programme are levied from quota owners, amounting to around 5% of the total fisheries levies charged to the industry or, on average, 0.14% of the port price. The levies are approved annually by the Minister of Conservation and are collected by the Ministry of Fisheries. During the year ended 30 June 2016, \$1,759,000 NZD was collected from the fishing industry for the [programme](#).

A Research Advisory Group, consisting of scientists, DoC and MPI staff, and industry and environmental NGO representatives meets annually to help prioritise potential projects and develop a Conservation Services Programme Annual Plan. The group reviews progress with relevant research and other activities, identifies research gaps, and then prioritises the gaps and related research proposals. A formal [public consultation process](#) is held on the annual plan prior to completion (Controller and Auditor-General, 2005; DoC, 2015). Over time, the reporting of

### CASE STUDY: Reporting and “Mis-Reporting” By-catch

A catch reconstruction effort was carried out by a group of academic researchers between 2011 and 2015. The team carried out 308 interviews with people involved in the commercial fishing industry. While the study's findings and methods have [raised questions and sparked debate](#), the authors estimated that about 20% of the total New Zealand commercial catch was high-graded or dumped in 2013. Though substantial, this still represents a significant decrease from an estimated 70% prior to the QMS's introduction in 1986 (Simmons et al., 2016).

protected species by commercial fishers has improved, particularly since the introduction of an improved recording system in 2008.

### Seabird By-catch

Around 85 of the roughly 145 seabird species that forage within New Zealand waters also breed there, and more than a third of those that do are endemic to the area. Of those species breeding in New Zealand waters, 47 are also considered threatened. Seabirds are caught incidentally in a wide range of New Zealand fisheries, including trawl, longline, and set-net fisheries (MPI, 2016a). Estimates of the number of seabirds captured in trawl and longline fisheries have been taken since the 2002-03 fishing year, based on the records of observers present aboard fishing vessels (see Figure 15 at the end of this section). These numbers may be significantly underestimated, however, as seabirds fatally injured as a result of interacting with fishing gear may not be observable (Richard et al., 2015).

The significance of fisheries seabird capture has been assessed in terms of the risk to seabird populations and by comparing the number of likely annual fatalities with the capacity of the population to replace the losses. Of the 70 seabird species assessed, 1 was placed in the “very high risk” category (black petrel) with a further 7 at “high risk” (5 albatross, 1 shearwater, and 1 petrel species). These numbers indicate that fishing activity still likely poses a significant risk to some species (Richard & Abraham, in preparation). This is without taking into account fishing’s other potential ecosystem impacts on bird species, including its effect on food availability (discussed below), which can cumulatively impact species.

The management response to the risk of fishing for seabirds has been a mix of regulatory and voluntary measures. Trawlers of 28 metres or more in length are now required to deploy a seabird scaring device, and regulations for longlining vessels of 7 metres or longer require the use of streamer lines in addition to night setting or line weighting. Offal management is also required by bottom longliners. Overall, there has been significant investment in research into, and development of, mitigation

strategies. In 2004, for example, the New Zealand government prepared a National Plan of Action to reduce the incidental catch of seabirds in fisheries, which it subsequently updated in 2013. Meanwhile, fishers have adopted a range of voluntary measures, and the Southern Seabird Solutions Trust is active in assisting fishers to reduce the risk they pose to seabirds.

### CASE STUDY: Southern Seabird Trust

Southern Seabird Solutions was formed in 2003 as a partnership between the fishing industry, the Department of Conservation, the Ministry for Primary Industries, WWF New Zealand, and Te Ohu Kaimoana Trustee Limited (TOKM). Its aim is to work collaboratively with commercial fishing fleet crews and skippers, as well as recreational anglers, to minimise the harm caused to seabirds through fishing. The Trust advocates the adoption of practical fishing practices to reduce accidental seabird capture. It operates an extensive educational programme, convening seabird workshops for skippers and crews (with over 210 fishers attending so far) and providing posters, guidelines, and videos on methods to mitigate by-catch and safely release birds. It operates an international mitigation mentor programme to cross-pollinate ideas between countries impacting the same seabird populations, with mentor swaps occurring between New Zealand and South American skippers and crews. In the Hauraki Gulf, it has convened a collaborative black petrel working group with almost all skippers on vessels in FMA1 (north-east coast of the North Island) completing Seabird Smart Fishing training and having Seabird Management Plans on board. It also takes fishers to seabird colonies to assist with seabird conservation work. The Trust convenes the Seabird Smart Awards to recognise people from the industry who demonstrate a passion and commitment to a seabird smart fishing culture.

### Sea Lion and Fur Seal By-catch

The New Zealand sea lion is endemic to New Zealand and is classified as nationally critical. The population, which historically ranged around both North and South Islands of New Zealand, has now been largely restricted to two main breeding areas in the Sub-Antarctic Islands due primarily to historic harvest. Because some southern trawl fisheries interact with sea lions, the animals can become caught in the trawl nets and drown (MPI, 2016a). There were an estimated 12,000 animals in 2009, and the population (as measured by pup production) has been declining since the late 1990s.

An estimated 143 sea lions were captured in trawl fisheries during the 1995-96 year, with the number halving to 74 two years later. An estimated 32 sea lions were captured during the 2012-13 year, 10 during the 2013-14 year, and 12 during the 2014-15 year (see Figure 15), while uncertainty around the estimates has been reduced by an increase in observer coverage. The fishery most likely to interact with sea lions, the Auckland Islands squid trawl fishery, had 88% observer coverage during the 2014-15 year, up from only 25% 5 years prior (MPI, 2016a). Sea lion exclusion devices (SLEDs) were voluntarily introduced into the fishery during the 2001-02 fishing year to enable sea lions to escape the net, and have since been widely adopted (MPI, 2016a). Nevertheless, there remains a number of scientific uncertainties around the impact of fishing on sea lions, as described above in Section 5.

In 2014, the Ministry for Primary Industries (MPI) and the Department of Conservation (DoC) initiated a process to develop a Threat Management Plan for the New Zealand sea lion. To inform the management response, a quantitative assessment of the risks to the sea lion populations was undertaken. This assessment identified three key threats facing the main Auckland Islands population which, if alleviated, would have the potentially greatest positive impact on population levels. The most significant threat was the disease *Klebsiella pneumoniae*, which has resulted in high pup mortality. This was followed by commercial trawl-related mortality, though the assessment found that the population was unlikely to increase



New Zealand fur seal

© Richard Wells

even if this particular risk was entirely eliminated. The third most influential factor was a lack of food availability, which may be impacted both by changes in climate and by fisheries harvest, since the sea lions target many of the same species as the fishing industry (Roberts & Doonan, 2016). Fishing-related mortality through a cap on incidental takes is the only threat that is currently managed.

The New Zealand fur seal population appears to be recovering after being decimated by historical harvesting prior to the 1890s. The current population may be around 100,000, with a similar number living in Australian waters. The population is not considered to be threatened. Seals are susceptible to capture in trawl nets, however, as shown in the estimates of seal by-catch included in Figure 14, page 110.

There has been no regulatory response to fur seal mortality, and seal exclusion devices are not used in New Zealand. Voluntary changes to operating procedures onboard vessels, such as better offal management, refraining from the use of shooting gear when seals are in the vicinity, and reducing the amount time the gear is near the surface, may have helped to reduce mortality numbers (Abraham et al., 2016; MPI 2016a).

### Dolphin By-catch

New Zealand has five resident dolphin species. The species particularly impacted by fisheries by-catch are the Hector's and Māui dolphins (which are endemic to New Zealand) and common dolphins (a short-beaked common dolphin which may be a unique sub-species, though this has yet to be determined). Hector's dolphins are found in coastal areas around the South Island, while the subspecies of Māui dolphins is only found along the west coast of the North Island. The Hector's dolphin population is fragmented with sub-populations on the west, east, and south coasts of the South Island. There is an estimated total of 12,000 to 18,500 Hector's dolphins. The east coast and west coast populations are thought to

be in decline, and the trend in the south coast population is unknown. The Māui dolphin population decline may have recently slowed, with a current adult population of just 63 (Baker et al., 2016). Both species are thought to have been in long-term decline since the introduction of monofilament nets during the 1960s, and there have been reports of capture in inshore set-net fisheries since at least the early 1970s.

The New Zealand population of common dolphins is not thought to be threatened, but there has yet to be a reliable estimate of its population. The dolphins are regularly caught during mid-water trawling for jack mackerels off the west coast of New Zealand (MPI, 2016a). There were few dolphin captures in the late 1990s, but this changed after the jack mackerel trawl fishery re-established during the early 2000s. During the 2002-03 year, there were an estimated 171 captures. Subsequently, however, this number was significantly reduced, dropping to an estimated 46 captures during the 2014-15 fishing year (see Figure 14) (Abraham et al., 2016; MPI, 2016a).

There has been no regulatory response to alleviate fisheries-related dolphin mortality, but the industry has adopted a

## CASE STUDY: Reducing Fisheries Impacts on Hector's and Maui Dolphins

The first measures to protect Hector's dolphins were put in place in 1988 with the establishment of the Banks Peninsula Marine Mammal Sanctuary and associated restrictions on set netting. These restrictions were extended along the Canterbury coast in 2001. A draft of a Hector's and Māui dolphin threat management plan was developed in 2007, followed in 2008 by an extended set of restrictions designed to provide further protection for the dolphins. The result was the establishment of another three marine mammal sanctuaries around the South Island coast and an extended range of restrictions

on the use of set-net and trawl gear (set-net gear has been shown to be the greatest threat faced by these dolphins) (Currey et al., 2012). The provisions only took effect in 2011 after a legal challenge from the fishing industry delayed implementation, and still today they only provide partial protection for the Hector's dolphin because they do not fully extend over the dolphin's habitat. Similarly, only 30% of Maui dolphin habitat is now protected from set nets and only 8% is protected from trawl nets (Leathers & Leslie, 2017). Notably, however, while Hector's dolphins are still caught in fishing gear, there has been no reported Maui

dolphin fisheries by-catch since 2012.

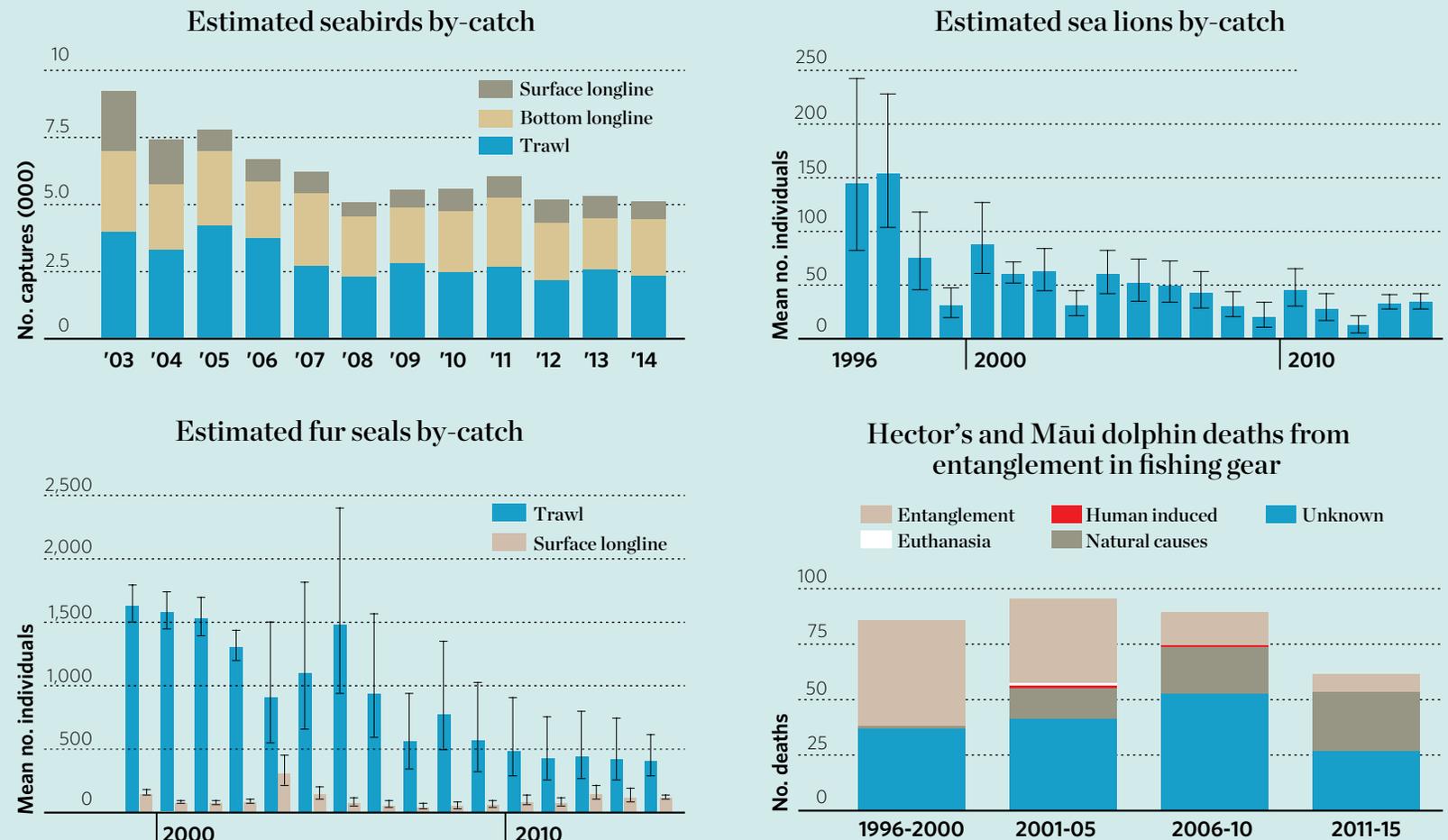
In December 2016, fishing companies Moana New Zealand and Sanford Limited together announced a joint plan with WWF-New Zealand to voluntarily remove, over time, their fishing-related threats from the entire Māui dolphin range. This includes, amongst other things, not leasing any of their Annual Catch Entitlement (ACE) to fishers using set nets in the coastal fishery after October 2017 and transitioning away from conventional trawl-fishing methods by 2022 (Moana New Zealand & Sanford, 2016).

voluntary code of practice which guides the operation of vessels to reduce the risks to the animals. When the impact of fishing activity on Hector's and Māui dolphins started to become apparent during the 1980s, regulatory measures were gradually imposed. More recently, the fishing industry has agreed to take additional voluntary measures in relation to the Māui dolphin.

### Deepwater Coral By-catch

New Zealand's oceans support a diverse range of deepwater corals, including a high proportion of endemic species. Stony coral species, in particular, provide biogenic habitat by forming reefs, mounds, and thickets which are commonly associated with high concentrations of fish and invertebrates (Anderson et al., 2014; Consalvey et al., 2006). Because deepwater corals

**FIGURE 14.** Estimated by-catch of seabirds, sea lions, fur seals, and Hector and Maui Dolphins



Sources: Department of Conservation, Ministry for Primary Industries



Fishermen hauling in their catch

© Deepwater Group Ltd

are fragile, slow growing, long-lived, restricted to certain habitats such as seamounts, and often have limited larval dispersal, they are especially susceptible to damage by bottom trawling and can take a long time to recover (Consalvey et al., 2006). Recognising this threat, all deepwater black corals, gorgonian corals, stony corals, and some hydrocorals have been listed in Schedule 7A of the Wildlife Act as protected species since 2010 (Baird et al., 2013).

Observers on deepwater vessels have recorded coral species brought on board as incidental catch, but this is not thought to fully capture potential impact. This is because large bobbins and rockhopper gear, which are used to protect the bottom of the net when trawling over hard substrate such as is found on seamounts, likely crush and break coral structures, whose fragments are unlikely to be retained in the net. Of the numbers of corals reported by onboard observers, around half (1,514 out of

a 3,141 total) were in the orange roughy fishery. This was followed by smooth oreo, black oreo, and hoki (Baird et al., 2013).

A risk assessment evaluating the overlap between predicted coral habitat and the bottom-trawling footprint identified a large overlap across the entire exclusive economic zone (greater than 50% of habitat) for the stony coral *Goniocorella dumosa*, whose main distribution is in New Zealand waters and can form large reef structures. However, for all the species studied, suitable habitat was also predicted outside the trawl footprint (Anderson et al., 2014; Consalvey et al., 2006).

### Impacts on Seafloor Structure and Bottom-Living Organisms

International literature and New Zealand studies have generally confirmed that the use of mobile bottom-fishing gear, including bottom trawling, dredging, and Danish seining, can have a range of impacts on benthic habitats, species, and communities. This includes reducing habitat structural biota and complexity, changing the relative abundance of species in favour of short-lived species, and particularly affecting populations of structurally fragile species such as shell fish, sponges, bryozoans, and corals. This, in turn can affect a range of biological processes, including the “transport and deposition of food, larvae, sediments, organic material, and dissolved chemicals.” Some species can become functionally extinct, and the recovery and resilience of communities can be affected to the point of causing regime shifts in some cases (Thrush et al., 2016). The greatest effects are likely to occur on seafloor habitats with a high degree of physical structure created by the resident organism. In areas of moderate to high flow, this can lead to sediments being armoured and protected by dense beds of suspension feeders (bivalves, bryozoans, sponges, and corals). With muddier sediments subjected to low flow, the seafloor topography can be strongly modified by resident animals, creating tube mats, burrows, and mounds on the sediment-water interface. The physical disturbance of fishing gear may be slower to manifest in these areas, but impacts on juvenile life-stages can result in long-term habitat change (Carbines et al., 2004;

Cranfield et al., 2001; Cranfield et al., 2003; Cranfield et al., 2004; MPI, 2016a; Rice, 2006; Thrush et al., 1995; Thrush et al., 1998; Thrush & Dayton, 2002).

A recent study assessed the effects of fishing on soft-sediment habitats in a range of shallow and deepwater locations around New Zealand. It found that fishing “was associated with reductions in the number of taxa, diversity and evenness of both epifaunal and infaunal communities, but more consistently with epifauna. Fishing appears to have reduced epifaunal biomass and productivity (whole community and fish prey) by up to 50% in some of the study sites, but effects on infauna were

less consistent.” The species most impacted were those that stood erect out of the seabed such as horse mussels, sponges, bryozoans, hydroids, sea pens, and tube-building polychaetes (Tuck et al., 2017).

### Impacts in Coastal Waters

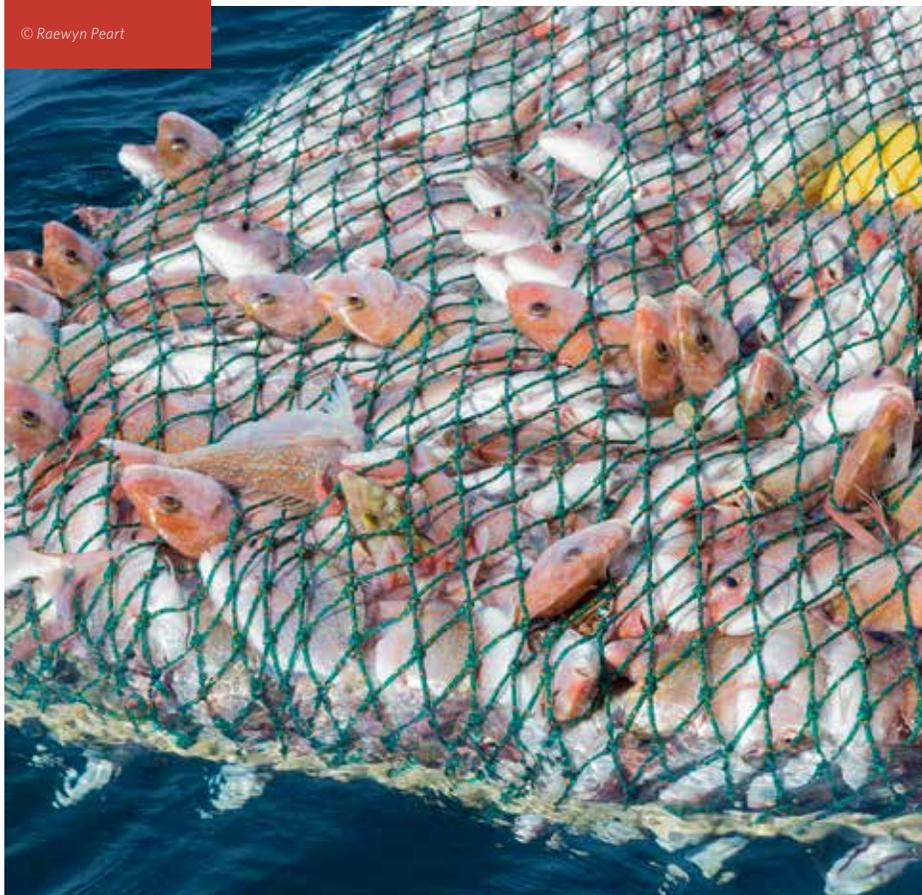
Analysis of trawl-fishing disturbance between 2008 and 2012 in New Zealand waters shallower than 250 metres identified a total trawl footprint during this time of 113,800 km<sup>2</sup>, which was just under half of the total seafloor within these depths (48%). Between 45,000 and 48,000 km<sup>2</sup> was disturbed in any one year, with only small changes between the size of the total footprint among the five years. Shallower areas received more trawl effort, with 59% of seafloor less than 50m deep being trawled over the 5-year period. Some areas were much more frequently trawled than others: the highest frequency for a single area was 2,884 trawl tows over 5 years, while the median was 68 tows. The most extensive trawling was undertaken in the terakihi, barracouta, red gurnard, and flatfish fisheries, with other trawl-targeted species being snapper, jack mackerel, trevally, and John Dory (Baird et al., 2015).

Less analysis has been undertaken on the spatial extent, and therefore impact, of Danish seining and dredging. A total of 26,768 Danish seine sets were reported during the same 5-year period, with the number of sets per year relatively steady. An estimated 99,727 dredge tows were undertaken in the Fouveaux Strait oyster fishery over 5 years, 55,895 scallop and oyster tows undertaken in the Challenger fishery region, 55,519 tows in the Coromandel scallop fishery, and 24,998 tows in the Northland scallop fishery (Baird et al., 2015).

The government management response to the potential impact of mobile bottom-fishing gear in inshore waters has largely consisted of protecting two areas from these methods: at Separation Point in Tasman Bay, where 156 km<sup>2</sup> was closed to power-fishing methods in 1980 to protect bryozoan beds, and off Spirits Bay in Northland, which was closed to trawling, Danish seining, and scallop dredging in 1999 to protect a unique sponge community. A number of other areas are

Snapper in Danish seine net

© Raewyn Peart

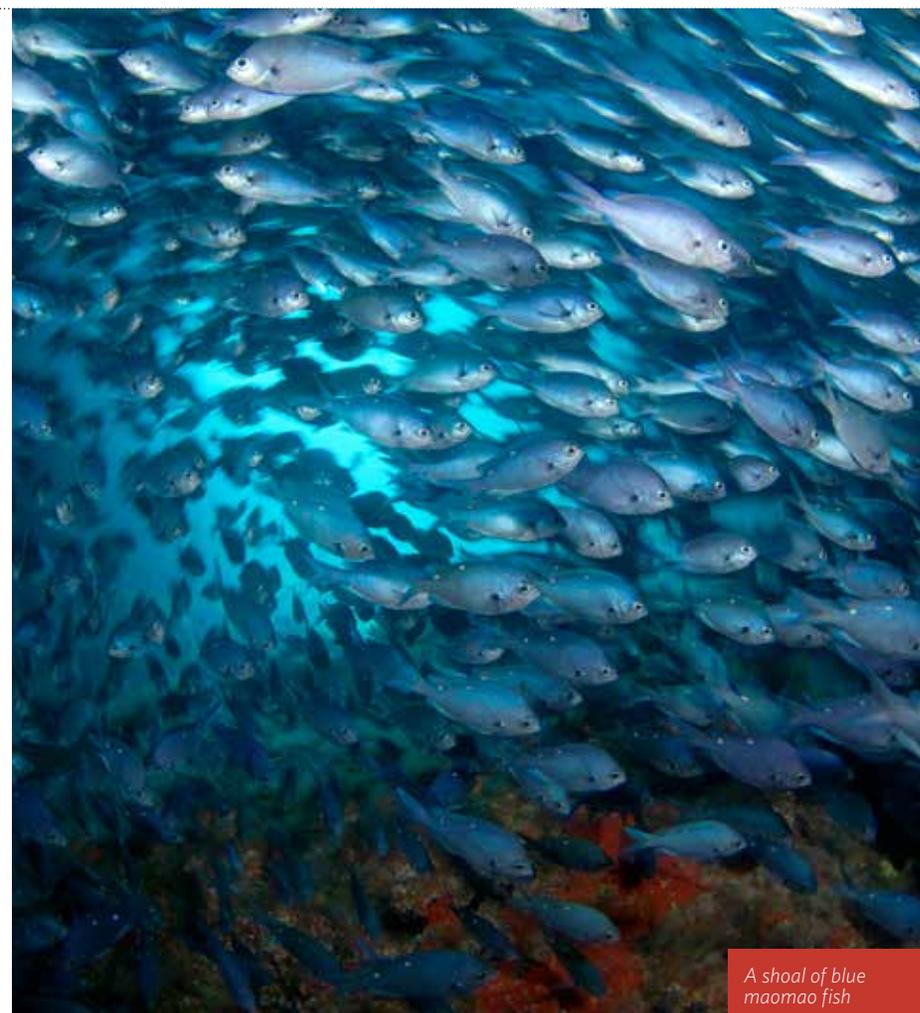


effectively closed to trawling, but have been restricted for other purposes, such as to create no-take marine reserves, protect marine mammals, avoid disturbance of pipelines and cables, or separate different fishing sectors. Around 11% of the coastal seafloor is currently closed to trawling (12,371 km<sup>2</sup>) (Baird et al., 2015). The Ministry of Agriculture and Fisheries undertook work to prepare a Benthic Standard, which was scheduled to be finalised in 2011, but the plan was subsequently abandoned.

### Impacts in Deepwater Areas

The trawl footprint for deepwater fisheries has been analysed for 23 years, from 1989-90 to 2012-13. The total area swept by trawl nets during this period is estimated at 347,290 km<sup>2</sup>, which is approximately 24% of the seabed area available for trawling (i.e. shallower than 1600 metres and outside protected areas). Trawling is primarily carried out in certain depth bands, with 34% of the seabed between 0 and 400 metres deep being impacted by trawl, and 31% of the seabed impacted by trawl at depths of 400 to 800 metres. New, previously untrawled seabed is impacted each year, although at a decreasing rate (and comprising <1% of the trawl footprint). The total area trawled each year has also been reducing, with the smallest annual area on record (41,511 km<sup>2</sup>) being trawled during the 2012/13 year (Black & Tilney, 2017).

In 2000, concerns about the impacts of trawling within the exclusive economic zone (EEZ), particularly on sensitive seamount habitats, led the government to close an area of 115,200 km<sup>2</sup> (containing 19 seamounts) to all trawling and dredging through regulations enacted under the Fisheries Act 1996. Concerns arose, for example, from a 2006 survey of seamounts in the Graveyard complex on the Chatham Rise that examined the effects of bottom trawling by comparing 5 fished and 3 unfished seamounts in proximity to each other. The survey found significant differences between the two groups of seamounts, with those that had been fished devoid of most of their coral communities (a 90% reduction in extent). The survey suggested that this was most likely due to the impacts of trawl equipment. Because they are slow growing and long-lived, recovery of the corals will likely take many years (Clark et



A shoal of blue maomao fish

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al., 2010). In 2007, in response to a proposal from the fishing industry, the government closed an additional 17 areas to bottom trawling and dredging, covering 1.2 million km<sup>2</sup> and 32% of the EEZ (see "Case Study" below).

### Food Web and Trophic Impacts

Fishing activity can impact the marine ecosystem by changing the relationship between different levels of the food web (trophic cascades), although this is an area that, to date, has received relatively little research. There are, however, some

relevant scientific findings related to New Zealand. As noted above, trophic impacts are considered to be a significant threat to sea lions (rated the 3<sup>rd</sup> greatest threat), though there is a lack of data and understanding about the direct link between fishing and food availability (Roberts & Doonan, 2016).

In coastal fisheries, trophic cascades in northern reef systems have been the focus of study, where an increase in urchin barrens and a reduction in algal forests has likely resulted from the reduction of large predators through fishing pressure. This effect has been explored through measuring the differences between predator numbers and algal cover in no-take marine reserves and nearby fished areas (see the case study below).

Notably, there are some indications that a reduction in food supply, as a result of commercial harvesting activity, may be affecting seabirds in New Zealand as well. In particular, there are concerns that commercial fishing is leading to a reduction in suitable prey for Buller's shearwater and red-billed gulls in the Hauraki Gulf. Research into this issue is currently being undertaken under the [Conservation Services Programme](#).

There has, as yet, been no management response to these trophic issues.

### CASE STUDY: Impacts of Fishing on Trophic Levels

Studies undertaken in 1998-99 within the no-take areas of Leigh Marine Reserve (established 1975) and Tāwharanui Marine Park (established 1982) found that predation of urchins was significantly higher (6.9 times), the density of urchins significantly lower, and the proportion of urchin barrens significantly lower inside the protected areas than they were in the seabed outside of the protected areas. Snapper was found to be at least 5.8 to 8.7 times more abundant within the reserves, with crayfish 1.6 to 3.7 times more abundant. At least 45% of the predation on larger urchins was by crayfish, which are a dominant benthic predator in unfished coastal-reef ecosystems and are important for maintaining the system's biodiversity (Babcock et al., 1999). In areas where there has been heavy fishing pressure on rock lobster stocks, such as along the north-east coast of North Island (CRA2), this ecological role has been so greatly diminished that scientists have noted

that rock lobsters are becoming "ecologically extinct" (MacDiarmid et al., 2012). Unlike crayfish and rock lobsters, snapper and blue cod were thought to only feed on smaller urchins (Shears & Babcock, 2002).

Sampling a wider range of six marine reserves on the north-east coast of New Zealand during the 1999-2000 year, scientists only found a clear difference between the area of urchin barrens for the Leigh and Tāwharanui sites where urchin barrens covered 10-60% of the reef in fished areas and 0-15% of the reef within the reserves. The study concluded that the urchin-barren phenomena is sensitive to locational factors. Urchin barrens were absent in the shelter of the inner Hauraki Gulf reserve (Long Bay) which had high sedimentation levels and low urchin numbers. They were higher in more recent marine reserves where predator numbers had not yet had the chance to recover (Shears et al., 2008).

A more recent analysis of the literature in New Zealand concluded that "there is strong correlative evidence" for increases in some predatory fishes, particularly snapper, and decreases in urchins and associated grazing molluscs. This has led, researchers suggest, to help increases in marine reserves. Diversity in coastal waters has been found to be strongly related to macro-algal cover, so the loss of the canopy-forming species causes serve reductions in diversity and primary production (Schiel, 2013).

However, the 2015 MPI Fisheries Plenary Report noted that it is difficult to demonstrate a definitive link, though it describes the ecosystem role played by rock lobsters and summarised the scientific evidence associating rock lobster harvest with urchin barrens. The potential biodiversity and ecosystem impacts of various stock levels and harvest strategies have yet to be incorporated into the stock assessment and TAC/TACC setting process.

## Section 6b: Economic Performance and Social Impacts from the Quota Management System

Commercial fisheries have always been and remain an important pillar of the New Zealand economy and are of importance to many New Zealand communities. The overall economic and social performance of New Zealand's fisheries sector has changed substantially under the QMS. It is difficult to paint a complete picture, however, as data are not available on all aspects of interest. For instance, there are relatively few data available on the economic changes experienced by individual fishers, especially those who participated in inshore fisheries prior to the QMS or who have entered inshore fisheries since then. However, available data do clearly show that there has been a significant increase in the economic wealth generated from commercial fishing (i.e. the quota share and annual lease, or ACE value) over and above what was available before the QMS was established. The beneficiaries of this value have changed as quota has been redistributed amongst participants and as the economic value created has been increasingly moved within the value chain towards quota ownership. Significantly, as discussed earlier in this report, a large proportion of New Zealand's quota, around 50%, is now owned by New Zealand's indigenous people through iwi (or tribal) ownership and affiliation.

### The Contribution of Commercial Fishing to the Economy

Business and Economic Research Limited (BERL) released a 2017 study (Williams et al., 2017) on the contribution of commercial fishing to the New Zealand economy. Its findings are summarised below.

**TABLE 6.** Economic Contribution of Commercial Fishing

Sector	Measure	Direct	Indirect	Induced	Total
Deepwater (excl Highly Migratory Species)	Output	738.1	796.4	252.8	1,787.2
	GDP	232.8	323.3	131.9	688.1
	Employment (FTEs)	1,839	2,835	1,085	5,759
Highly Migratory Species	Output	71.2	75.5	24.2	172.0
	GDP	22.4	31.1	12.6	66.1
	Employment (FTEs)	178	273	104	554
Inshore (Finfish only)	Output	497.0	533.7	168.1	1,198.8
	GDP	155.8	216.9	87.7	460.5
	Employment (FTEs)	1,245	1,901	721	3,867
Shellfish	Output	129.4	134.0	39.6	302.9
	GDP	38.7	55.0	20.6	114.3
	Employment (FTEs)	338	478	170	986
Rock Lobster	Output	325.3	356.8	116.4	798.5
	GDP	104.9	144.3	60.7	309.9
	Employment (FTEs)	794	1,270	499	2,563
Grand Total	Output	1,761.0	1,897.5	601.0	4,259.5
	GDP	554	771	314	1,639
	Employment (FTEs)	4,394	6,756	2,579	13,730

*Output and GDP are 2015 in \$ NZD mill. Note: Table is reprinted from Williams et al., 2017.*

In 2015, commercial fishing, which comprises both fishing and seafood-processing activities, provided a direct output value of \$1.76 billion NZD. Using multiplier analysis, commercial fishing provided a total output value of \$4.26 billion NZD. The total economic contribution of commercial fishing to GDP was \$1.64 billion NZD in 2015, and was responsible for the employment of 13,730 full-time equivalents (FTEs) (see Table 6).

Within the inshore sector, finfish contributed about 52% of this sector's impact, with rock lobster making up about 35%, and shellfish 13%. Paua contributes about 52% of the direct output of the shellfish sector. Snapper, meanwhile, contributes about 19% of the finfish industry. Between 2008 and 2013, on average, the combined fishing and seafood-processing industry directly contributed \$554.5 million NZD in GDP and employed 4,394 FTEs. The fishing industry (harvesting of fish only) averaged \$929.8 million NZD in gross revenue and directly employed approximately 2,544 FTEs, while the seafood-processing industry earned an average gross revenue of \$1.3 billion NZD and employed approximately 3,051 FTEs.<sup>4</sup>

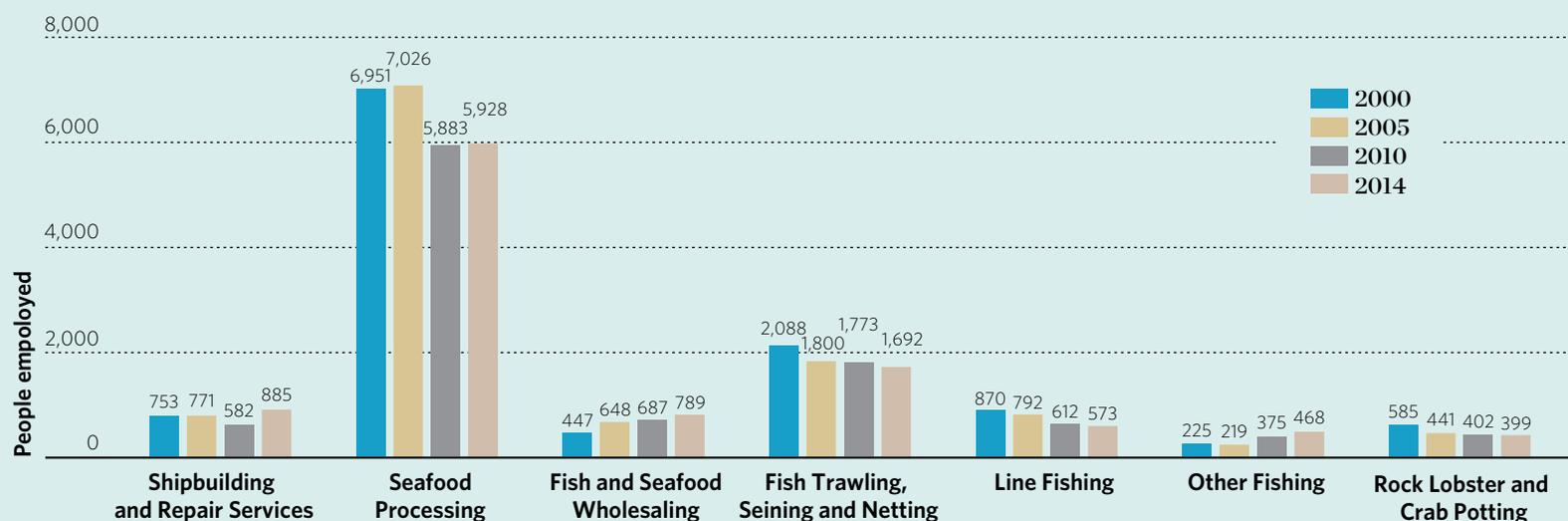
4. There is a high degree of dependency between the fishing and the seafood processing industries. The overall economic contribution of these two sectors needs to account for the overlap between them, where the output of one industry is an input into the other. The fishing industry provides the raw products for processing and relies on the seafood-processing industry to purchase its harvest. A number of New Zealand companies operate in both of these sectors because of this high degree of dependency. This practice allows them to exploit synergies in their fishing, processing, and marketing.

### Employment

Between 2000 and 2014, the fishing sector has seen a slight decline in employment, from 11,919 people in 2000 to 10,734 people in 2014 (Williams et al., 2017). As shown in the above table and in Figure 15, however, three of the seven industries have seen an overall increase in employment across the 14-year period. Those that experienced increases are Shipbuilding and Repair Services, Fish and Seafood Wholesaling, and Other Fishing. Other Fishing and Fish and Seafood Wholesaling have seen increases across the entire 14-year period, while Shipbuilding and Repair Services have experienced a substantial rebound in employment numbers from 2010 to 2014 after having a large drop in employment between 2005 and 2010 (Williams et al., 2017).

Of the remaining four industries, the largest decline in absolute employment has come from the Seafood Processing industry, which, after a small increase of around 70 people between 2000 and 2005, has seen almost 1,100 people leave

**FIGURE 15.** Employment in the fishing sector, by industry



Source: Williams et al., 2017

the industry between 2005 and 2014. Some of this decline is likely due to outsourced processing of a portion of post-harvest fish, particularly to China. These fish are headed, gutted, and frozen in New Zealand, and then transported to processing sites where they are thawed, reprocessed, and refrozen for export back to New Zealand or to third country markets (Stringer et al., 2011). For the second largest industry, Fish Trawling, Seining, and Netting, there has been a steady decline in employment numbers across the 14-year period. Employment numbers for this industry decreased by almost 400 people between 2000 and 2014 (Williams et al., 2017). In the 2014 year—the latest year available—there were 309 enterprises engaged in the Fish Trawling, Seining, and Netting industry, 348 in the Line Fishing industry, 366 in Other Fishing enterprises, and 246 enterprises in the Rock Lobster

and Crab Potting industry. In the 2014 year there were 132 business units in the Seafood-Processing industry.

### Exports

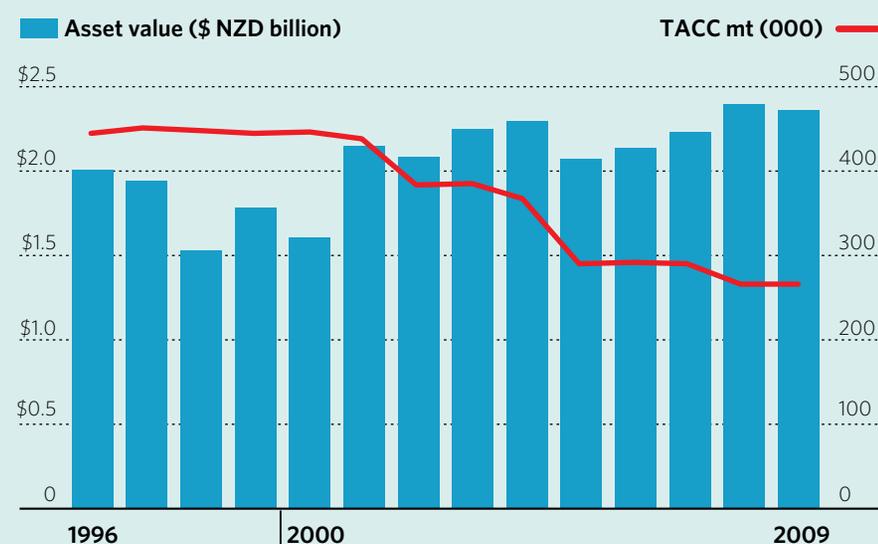
Fish exports in 2015 amounted to \$1.5 billion NZD, making fish New Zealand's fifth largest export commodity by value. It represents 3.2% of exports, totalling \$46.6 billion NZD. Of this, \$205 million NZD reflect exports of frozen hoki and \$302 million NZD reflect exports of live rock lobster (Williams et al., 2017).

### Quota Value

Under the QMS, as it exists today, quota rights change proportionally to the Total Allowable Commercial Catch (TACC), up or down. Quota value reflects the anticipated Annual Catch Entitlement (ACE) revenues,<sup>5</sup> including the future expected risk or volatility of such earnings. Some 2,200 individuals and companies now own quota as part of the QMS, which has a value that now exceeds \$3.5 billion NZD (Williams et al., 2017). To put this in global perspective, the 2016 report from the World Bank estimates that improved management of fisheries worldwide would increase net benefits received from the current, meagre annual return, measured as economic rent, from \$3 billion USD to \$83 billion USD. Quota allocated into the QMS was estimated to be worth in excess of \$2.7 billion NZD by 1996, of which the value of the first 26 species introduced contributed \$2 billion NZD. By 2009, this value had increased to about \$4 billion NZD, with the value of the first 26 species increasing 18% to \$2.4 billion NZD. This increase in value was remarkable given that Total Allowable Catches (TACs) for the initial 26 species introduced decreased by 41% between 1996 and 2009 (see Figure 16).

5. The value of Annual Catch Entitlement (ACE) in a fishery is the amount a fisher is willing to pay for use of that right to meet their legal obligation to balance catch against ACE. If ACE is not used to balance catch, then the fisher is required to pay a deemed value to the government, which is set at a level that exceeds the ACE price. The value of quota therefore is the present value of all future ACE earnings and it represents the "interest," or return expected, on the capital value of the quota asset.

**FIGURE 16.** Total asset values and TACC catch levels for the 26 species first introduced into the QMS between 1996 and 2009



Source: Statistics New Zealand



Recreational fishers  
in the Firth of  
Thames

© Raewyn Peart

Quota owners, including iwi, obtain a return on the capital value of quota from the sale of ACE each year, whether this is accounted for internally within a vertically integrated company or by sale to another entity. Under the QMS, the dollars received from the sale of ACE accrue to the quota owner, whether they are fishers or not. The increased value of quota shares (a capital asset) has largely been a result of economic efficiency (reduced catching capacity) along with technology improvements in the value chain. As quota ownership has consolidated through trade and seafood businesses have developed, there has been a restructuring of the industry away from economically marginal operations towards vertically integrated commercial operations.

In studying the relative merits of quota systems in New Zealand, the United States of America, and Canada, Grainger and Costello (2014) found significantly higher economic

performance in quota systems in New Zealand, where property rights are more secure.<sup>6</sup> Relative to United States and Canadian systems, they found that the ratio of economic dividends to price in both countries corresponded to weaker quota property rights when compared to New Zealand. The authors found, in particular, that the settlement of indigenous rights, and the security this created, added significant value to the quota asset when compared to elsewhere. Quota has thus become more than a right-of-access to harvest a particular quantity of fish (a “profit a prendre”); it is also an expression of Māori indigenous fishing rights.<sup>7</sup>

## The Contribution of Recreational Fishing to the Economy

While there are methodological problems in comparing economic estimates of commercial and recreational fishing value, there is no question that recreational fishing, carried out by a third of New Zealanders and an increasing number of international visitors, is an important and growing part of the New Zealand economy. Recreational fishing value is high, estimated recently to be worth \$1.68 billion NZD in economic activity each year (Holdsworth et al., 2016).

There are also earlier studies. In 1991, a nationwide telephone survey of 3,495 people estimated an annual expenditure on recreational fishing (fresh and saltwater) of \$745 million NZD (National Research Bureau, 1991). During the 1998-1999 fishing year, a survey was undertaken of a random sample of 3,655 fishers in order to identify their willingness to pay for the

6. Ragnar Arnason, one of authors of the Review, also argues that the economic performance (measured as the present value of the quota program) decreases as the probability of retaining the property right approaches zero (Korolev, 2011).

7. In its Goods and Service Tax ruling, the New Zealand Inland Revenue describes quota as having the distinct characteristics of a “profit a prendre,” that is, “broadly an ongoing right to take something tangible that is present on another persons land.” But the New Zealand Inland Revenue nonetheless dismisses this as an appropriate definition for ITQ rights in New Zealand as, inter alia, “the Crown ownership of the land under the water in respect of which an individual transferable quota is granted is not completely determined.” For this reason they conclude that “Individual transferable quota and annual catch entitlements have to be regarded as unique property rights, with their characteristics determined from the provisions of the fishing legislation.”

fishing trip. The study estimated that the total value of trip-based recreational fishing for five species (snapper, kahawai, rock lobster, blue cod, and kingfish) was \$973.5 million NZD. In addition, people valued the fishing experience at \$219.6 million NZD a year (average willingness to pay), and the total value of the recreational catch for those five species was \$26.2 million NZD (marginal willingness to pay) (South Australian Centre for Economic Studies, 1999).

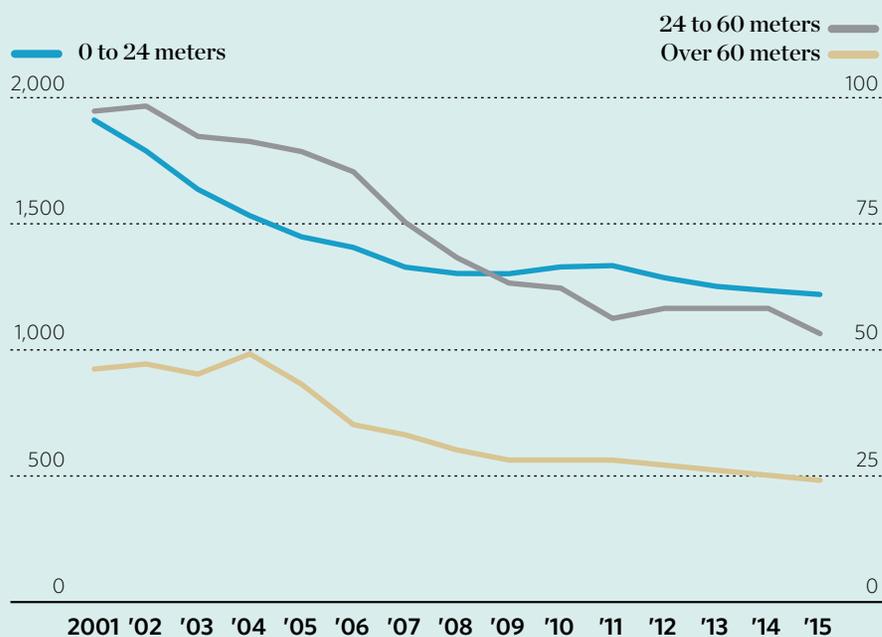
A more recent study undertaken for the 2014-2015 fishing year focused on identifying the economic contribution of recreational fishers' expenditures, including spending on the trip, fishing equipment, and the fishing-related proportion of large equipment such as boats, vehicles, and holiday homes. Data on spending was obtained by undertaking a national online panel survey. This study estimated the total expenditure at \$946 million NZD, which is somewhat less than the 1999 study including trip-related expenditure for only five species, particularly after taking into account the impact of inflation. The impact of this expenditure on the economy (and after GST and leakages through imports were removed) was estimated at just under \$640 million NZD, value added. Of this, \$68 million NZD was contributed by international visitors: 109,000 visitors took part in recreational fishing in 2014, and a quarter of them visited New Zealand primarily to fish (Holdsworth et al., 2016).

## Impacts on Commercial Inshore Fishers

As noted previously, a precursor to the introduction of the QMS in 1986 was the exclusion of part-time fishers under the Fisheries Act 1983, which had a disproportionate impact on some regions. For example, half of Northland fishermen were excluded (300 out of 600, of whom a large proportion were Māori), with the result that all harvesting for sale had to cease in some small coastal communities. This likely caused considerable hardship for communities in areas that already had high unemployment levels (Fairgray, 1985; Johnson & Haworth, 2004; Law Commission, 1989).

During the first 20 years after the QMS was introduced, an additional 3,000 fishers exited the industry. There were multiple reasons for this. Of fishers who were initially allocated quota for free, some sold out and reinvested the proceeds in other activities or to fund their retirement. A survey of quota owners and Annual Catch Entitlement (ACE) lessees who exited the industry between 1987 and 2001 found that the leavers were mainly small-scale inshore operators deploying low-cost fishing methods such as longlining, lobster potting, and set netting. They were mostly quota owners who also leased some ACE, were typically in their 40s, and had been involved in the industry for 15-20 years. Two-thirds of respondents left the fishing industry altogether, but most leavers continued to work in some other field rather than going into unemployment or retirement (Stewart et al., 2006). The survey also showed that fishers generally expressed reluctance to exit and some

**FIGURE 18.** Fishing vessels by size class, 2001-2015



frustration at their inability to expand their operations to enable an acceptable level of profitability. Minor quota owners and holders had concerns over low profitability, as it was major quota holders who generally had a higher return on assets.

An area of concern for fishers leaving the industry was the administrative burden and costs of the QMS and uncertainty regarding the future policy and direction of the fisheries management system (Stewart & Walshe, 2008). An analysis of the change in the number and composition of registered vessels after the introduction of the QMS found that the introduction of the cost-recovery regime in 1994 likely drove some marginal operators out of the inshore fleet, as there was a marked reduction in the number of small vessels after that date (Connor, 2001a). While data on vessel numbers between 1986 and 2001 were not available, the reduction in the number of fishing boats (regardless of vessel size) appears to decline through 2008. From 2009 onward, vessel numbers have continued to decline, albeit at a slower pace (Figure 18).

For inshore fishers that stayed in the industry or entered later, the QMS has changed the way in which independent harvesters configure their businesses. The extent of quota ownership affects the ability of a harvester to access the fishery and/or to capture a greater proportion of the value of the fish. Some fishers have continued to fish on their own or with crew in single-vessel businesses. Others have invested in additional vessels to develop small fishing companies, employing both skippers and crew. Many harvesters, though the exact proportion is unknown, now own no quota and are reliant on obtaining ACE each year to cover their catch. Others have retained some or all of the required quota to support their harvesting activity.

ACE harvesters are wholly reliant on being able to source ACE each year from another party in order to go fishing. Some have formed long-standing relationships with fish-processing companies who supply the ACE on the condition that the fish harvested is supplied to their plant. Some harvesters, at the time of selling their quota, negotiated an agreement

that they would have access to the ACE generated from it for a given time period or for the duration of their fishing career. This has enabled them to ensure access to the fishery whilst benefiting from the capital derived from the quota sale.

Because fishers who do not own quota must buy ACE or accept a price for the fish from an ACE-owning processor who deducts the cost from the fisher's payment, the net annual return to fishers who do not own quota is less than is returned to quota-owning fishers. ACE prices differ significantly among stocks, dependent on the market value of the fish, the cost of fishing, and the balance of supply and demand for ACE for a particular stock. Where the ACE is required for a stock that is a choke species, for example, the purchase price of the ACE may be high because the price attracts some of the value of the target fishery.

Rationalisation of fishing activities is continuing. As ACE is becoming increasingly committed to longer term agreements between quota owners and harvesters, a decreasing amount of ACE is freely traded on the market and it is becoming more difficult to obtain. In addition, private quota holders and iwi collective partnerships often bundle ACE into sizeable parcels containing multiple stocks. This practice can effectively exclude small harvesters who lack the resources to deal with large parcels from participating in these markets (Stewart & Leaver, 2015). In the event of a decrease in the TACC and an associated decrease in the quantity of ACE available for a stock, it is the harvesters who lack long-standing arrangements for supply that risk losing access to the fishery.

**Rationalisation of fishing activities is continuing. As ACE is becoming increasingly committed to longer term agreements between quota owners and harvesters, a decreasing amount of ACE is freely traded on the market and it is becoming more difficult for individuals to obtain.**



A fishing trawler in rough seas

© Terry Hann

## Impacts on Mid-Depth and Deepwater Commercial Fishers

As of 2016, according to the Deepwater Group ([www.deepwater.org](http://www.deepwater.org)), the New Zealand deepwater fisheries sector involves more than 50 seafood companies operating more than 60 commercial vessels between them. Mid-depth and deepwater fishing requires large boats, with the majority of vessels being longer than 60 metres and having at-sea processing capacity. In the early days of deepwater fishing, most of the catch was taken by foreign vessels (with foreign crew) chartered by and operating under joint ventures with the New Zealand seafood companies that owned the quota. As described in Section 2a, a driving force for the introduction of the QMS was to encourage investment in these larger-scale offshore fisheries. As this sector has grown, so too has investment by New Zealand companies in larger vessels capable of

fishing and processing mid-depth and deepwater fish. Foreign charter vessels (FCVs) nonetheless remained a significant part of the New Zealand fishing fleet for many years, accounting for more than 50% of the fish-catch volume landed in New Zealand in 2012. However, substantial concern about inhumane crew conditions on some foreign vessels (Skinner, 2012) eventually resulted in a Ministerial inquiry (MAF, 2012). In the end, widespread demands that the government address employment conditions on FCVs led to the decision that all FCVs reflag to New Zealand, meaning that they operate under full New Zealand legal jurisdiction in regards to employment and health and safety conditions while fishing in New Zealand's exclusive economic zone. Many of the vessels now operating in New Zealand's mid-depth and deepwater fisheries are also considered "state of the art" and are crewed by highly professional captains and crew. Most of these ships also have processing capacity and workers on-board.

## Impacts on Recreational Fishers

While recreational and commercial fishers both value a healthy ocean and sustainable fisheries, they frequently have different objectives for fisheries management. Recreationalists often prefer higher catch rates and fish size than commercial fishers, and they are usually more constrained as to the time and place of their fishing activity. This means that commercial fishers in some cases may benefit more from a stock that is managed to  $B_{MSY}$  whereas recreational fishers benefit from larger stocks and greater abundance (Connor, 2006). Both sectors may also have differing interests when it comes to the span of time required to rebuild overfished stocks. In some New Zealand-shared fisheries, such as snapper, rebuild times as long as 25 years have been adopted to reduce the financial impact on the commercial sector. In the short term, however, this approach delays the delivery of benefits to the recreational fishing sector (Connor, 2006). On the other hand, catch reductions wanted by recreational fishers to increase abundance (i.e. biomass) could potentially come at a substantial cost and uncertain long-term net economic benefit to commercial fishers because of a reduced TACC. The economic risk for commercial fishers

## Fewer young fishers were entering the industry because they lacked the capital to buy quota and because leasing reduced the margins on the fish they sold.

is exacerbated because the Fisheries Act specifically exempts the Crown from having to pay compensation for TACC reductions implemented to ensure sustainability. This exemption guarantees that reallocation comes with no explicit financial consequences for the government (Fisheries Act, 1996, Section 308(2)). Because recreational and commercial fisheries are managed under different systems and because New Zealand leaves allocation decisions to Ministerial discretion rather than establishing effective mechanisms for inter-sectoral dialogue and problem solving, allocation decisions in New Zealand are always contentious and politically charged (Bess, 2017).

### Impacts on Coastal Communities

When the QMS was introduced, maintaining active fisheries in small coastal communities was not an explicit objective. Nevertheless, a number of targeted studies have been carried out to assess the impact

of the QMS on coastal communities. Though we are unaware of comprehensive data on the overall impact of the QMS on New Zealand's coastal communities, the results of these targeted studies are summarized below.

A study undertaken during the late 1990s of three small coastal fishing communities in the South Island (Riverton, Moeraki, and Havelock) documented the changes to the fishing fleets between 1976 and 1997 and tracked how the communities dealt with a reduction in their fishing industry. The reduction in fleet numbers was significant for all the communities: Riverton's fleet dropped from 118 to 50, Moeraki's fleet dropped from 36 to 15, and Havelock's fleet dropped from 78 to 13. The researchers attributed the reduction to the fishing industry's "boom and bust" cycle, whose variation is closely linked to changes in stock abundance. These communities

have all now turned to tourism, and in one case to mussel farming, in order to support the local economy. In addition, some former fishing boats were converted into charter boats for domestic and foreign visitors (McClintock et al., 2000).

In Riverton, after the introduction of the QMS, older fishers sold out to processing companies who, in turn, sub-leased to other fishers. As a result, fewer young fishers were entering the industry because they lacked the capital to buy quota and because leasing reduced the margins on the fish they sold. In Moeraki, it was a different story with the same result. Poor lobster catches during the 1990s prompted fishers to sell off quota in order to sustain their fishing activity and maintain their boats. The rising price of rock lobster quota made it difficult for young fishers to enter the industry. Examining these communities' experiences, the researchers concluded that many aspects of the QMS favoured major companies at the expense of small operators "who lack the administrative skills and capital to maintain their positions within the industry" despite having "comprehensive knowledge of their fishing territory" and being "good conservators" (McClintock et al., 2000).

In Northland, the QMS was considered by one academic commentator to be "nothing short of an economic disaster to many small communities," with the number of commercially registered vessels in far north ports reduced from 257 in 1990 to 134 in 2009. Some settlements, such as Taipa and Awanui, lost all their commercial vessels, while in Houhora the numbers dropped from 67 to 22. Closure of fish plants also resulted in job losses, as catch was increasingly being trucked to Auckland (Winder & Rees, 2010).

One examination of the QMS's social implications for Hauraki Gulf fishers and their communities included interviews with 63 informants collected from 2006 and 2007. It focused on three fishing communities; Waiheke Island, Coromandel, and Leigh. Of these, Waiheke completely lost its fishing fleet, which had numbered 36 in 1980 and accounted for half of the Auckland long-line fleet at the time; Coromandel lost

most of its fleet, which reduced from 49 before the QMS to 8 in 2006-7; and Leigh retained its fleet of around 18 boats, as well as a fish processing plant. Leigh Fisheries is still the major employer in that community, with most households connected directly or indirectly to the company (Duncan, 2011). The study identified a number of social impacts resulting from the change in the fishing fleet after the QMS was introduced. Some fishers reported that selling quota enabled them to successfully set up an alternative livelihood, while others reported that they regretted the loss of a lifestyle that they highly valued, as well as the inability to pass the fishing business onto their children. Fishers who became dependent on ACE tended to be marginalised. There were fewer opportunities for deckhands and less certainty of ongoing careers for aspiring new entrants. Fishers who were not highly literate, but who were expert fisherman, were effectively excluded from the industry by the new reporting requirements. At the time of the research, fishers were being paid little, if any, more for their catch than they had been prior to the QMS introduction, yet their costs had increased significantly with requirements such as levies and surveys. In addition, the fishers shifted from being community based, selling their catch locally, to being providers for companies located elsewhere (Duncan, 2011).

For the affected communities (as opposed to the individual fishers), the study found that there were also costs, particularly for Waiheke Island and to a lesser extent Coromandel. These included the loss of a system to pick up youth, who would previously have worked on the fishing boats; a diminished ability to buy fresh fish, along with the health implications associated with this dietary change; a lack of connection with the biophysical environment; and a loss or change of identity. Waiheke Island subsequently developed into a marine suburb of Auckland and re-oriented its economy toward the tourism and wine industries; Coromandel developed into a tourist-orientated centre based on a growing aquaculture industry and a rich gold-mining history; and Leigh largely remains an active fishing community (Duncan, 2011).



*A traditional powhiri challenge and welcome at the Māori cultural experience at Tamaki Village, Rotorua*

© Graeme Murray

## Socio-Economic Impacts on the Māori

The settlement of claims made by Māori to recognise their indigenous rights to fisheries in the form of quota, as well as the subsequent allocation of settlement assets to iwi that are geographically and regionally based around New Zealand, has added a new and still unfolding dimension to the role of fisheries-derived revenues in local community development. The significant quota assets owned or providing dividends to iwi (estimated to be somewhere between 30 and 50 percent of all New Zealand's quota holdings), are providing direct and sustainable financial injections to many local communities where iwi are based. They are also helping to fund the development of other local ventures, particularly around the rapidly growing tourist market.

Moana New Zealand Limited, for example, is beneficially owned by the 58 Mandated Iwi Organisations (MIOs) that were recipients of quota in the settlement of indigenous claims

to fishing rights. Share ownership of iwi in Moana varies depending on the specific settlement. Moana's 2016 Annual Report records that the company holds quota shares valued at \$243 million NZD, plus a shareholding in another large seafood company, Sealord Limited, worth a further \$182 million NZD. These are the key assets that contribute to a total shareholder equity of \$425 million NZD. In 2016 alone, Moana recorded an after-tax profit of \$21.2 million NZD (or about a 5% return on equity). Some \$8.2 million NZD of this profit was paid in direct (after tax) dividends to iwi. The cumulative payout over the prior 6 years totalled \$38.8 million NZD. These dividends represent the return on the quota-share asset funded, at least in part, from the sale or use of ACE generated from these assets each year (Moana New Zealand, 2016).

### CASE STUDY: Ngāti Mutunga o Wharekauri

Ngāti Mutunga o Wharekauri (Chatham Islands) is one of two indigenous New Zealand tribal groups that claim the Chatham Islands. It has a population base of 1,641, according to the 2013 Census. In 2016, 1,148 individuals were registered members of the Ngāti Mutunga o Wharekauri Iwi Trust, which is a mandated iwi authority for the purposes of the Māori Fisheries Act 2004. In 2005, the Trust was allocated Fisheries Settlement Assets comprising quota shares valued at \$12.5 million NZD, shares in Aotearoa Fisheries Limited (now Moana New Zealand Limited) valued at \$0.4 million NZD, and \$0.85 million NZD cash as part of the fisheries settlement process. In the 5 years since 2012, the Trust's initial asset base has grown by 26% to over \$24.8 million NZD. These assets are managed by a wholly-owned asset holding company (AHC) that provides up to 40% of annual profits to the Trust for distribution and re-invests the balance. A kaupapa of the Trust, which are the principles that the iwi established for its operation, is to improve the health and welfare of the iwi and its people, provide financial assistance, and promote educational and vocational training. In 2016, the Trust received \$550,000 NZD from the AHC to support various iwi-wide development programmes. This work has included building 3 homes and 2 flats for rental to iwi families and elderly members, running bi-monthly Māori language and cultural development programmes, and supporting member education (<http://www.nmow.co.nz>).

Among individual iwi there has been substantial diversity in how quota is utilized for socio-economic gain. A few examples follow:

Some iwi, such as Ngāi Tahu, have become directly involved in the seafood industry by providing quota to Māori harvesters, as well as by owning and operating processing and exporting facilities. Ngāti Kahungunu, by contrast, does not directly own vessels or a processing plant; rather, it has formed a partnership with a local seafood company, leasing their quota to the company which, in turn, employs over 200 iwi members in its operations. Other iwi have not become directly involved in the industry as such, but manage their quota as part of the tribal asset base, leasing their ACE to provide annual income flows and using the proceeds to fund tribal activities. Although this second strategy has provided many economic and social benefits to the tribe from enhanced income, it has not necessarily served to strengthen the traditional relationship between tribal members and cultural seafood harvesting and management practices.

### Perceptions of Fisheries Management in New Zealand

Interest in fisheries and their management is high in New Zealand. Government consultations regarding fisheries matters tend to receive substantial input (e.g. 426 submissions were received on the government's "Fishing for our Future" consultation last year). New Zealanders' perceptions regarding the effectiveness of the fisheries management system have been surveyed multiple times since the QMS was adopted. While the specific framing and outcomes of individual surveys have varied somewhat, the overall national perception regarding the status and management of fisheries does not necessarily accord with the high ranking of national government reports and international assessments.

What was probably the most comprehensive national consultation on marine issues in New Zealand was undertaken in 2001 as part of an initiative to develop an oceans policy (which subsequently stalled). A Ministerial Advisory Committee held

71 meetings throughout New Zealand. 2,000 people attended the meetings, and the Committee subsequently received 1,160 written submissions from a wide range of sectors around the country. The Committee's analysis of these submissions provides useful insight into New Zealanders' values regarding the ocean and how they viewed fisheries-related issues at the time (Ministerial Advisory Committee on Oceans Policy, 2001).

The most frequently identified value associated with the oceans was recreational (860), followed by the environment (714) and food source (643), with economic values coming fourth (639). In terms of themes raised, the most frequent was pollution (raised in 764 submissions), followed by controls on over-fishing and depletion of resources (718), and control on sewage discharge and pesticide runoff (651). On specific fishing matters, the most frequently raised issue was limiting commercial fishing (336), followed by controlling trawler and drift-net fishing (173), and limiting recreational fishing (145). A theme strongly reflected in over half of the submissions was the need to maintain environmental well-being and integrity in the oceans, indicating the presence of a strong environmental ethic.

A study undertaken in 2004 by the Centre for Research, Evaluation and Social Assessment, under commission from the Department of Conservation, sought to elicit stakeholder views about the marine environment and its protection through 14 semi-structured focus-group meetings. These meetings were attended by 100 people from a range of sectors, including commercial and recreational fishers, conservationists, recreational boat users, and local coastal communities. The impact of fishing on the marine environment was the topic of discussion in a number of the focus groups, with specific concern expressed over some commercial-fishing methods that were perceived to be indiscriminately catching fish with the capacity to "clean out" habitats. According to the report, "dredging was frequently identified as causing the decline or destruction of scallop beds [and] the destruction of the seafloor (making it 'like a ploughed field')..." Participants described seeing the evidence of such fishing methods, including discarded fish lying



Freshly caught snapper

© Josh Griggs

on the surface and "the disappearance of some species from previously abundant fishing sites" (Warren & Proctor, 2005).

A group of academics based at Lincoln University have been consistently surveying public perceptions of New Zealand's environment since 2000. The results of the 8<sup>th</sup> survey, undertaken in February-March 2016, were recently released. The survey probes a range of views on the adequacy of the management of marine fisheries amongst other environmental domains (Hughey et al., 2016). The authors note that public perceptions do not necessarily coincide with objective state-of-the-environment data, but that the survey does provide an indication of the extent to which the public have confidence in fisheries management and how such confidence has changed over time.

An analysis of the first two surveys (2000 and 2002) showed that "marine fisheries" was rated as the poorest-performing

environmental sector in New Zealand, although it was still rated within the adequate-to-good range (Hughey & Kerr, 2002). The most recent 2016 electronic survey (which received 2,468 responses) found that, in general, "New Zealanders continue to consider the state and management of New Zealand's environment to be good, and better than in other developed countries; ... The states of air, native bush and forests were rated highest, while rivers and lakes, and marine fisheries were rated as being in the worst state." The perceived "condition" and "quantity" of marine fisheries was still in the "adequate" range (as opposed to "good/bad" or "very good/bad") but the overall rating declined between 2013 and 2016.

In terms of the quality of management, marine fisheries was ranked the second lowest after the management of freshwater systems, with the score declining since 2010 to less than "adequately managed." This indicates that public confidence in the fisheries management system has declined over the past 6 years. The main cause of damage to marine fisheries was overwhelmingly attributed to commercial fishing (identified by 78% of respondents; up from 60.1% in 2000), followed by sewage/stormwater (38%, slightly up from 32.3%) and recreational fishing (25.4%, up from 15.4%).

A survey undertaken in October 2016, with 2,019 nationwide respondents from Horizon Research's online panels, probed

## Environmental Sector's Concerns Regarding Fisheries Management

In 2001, the Ministry of Fisheries commissioned the Environmental and Conservation Organisations of Aotearoa (ECO) and Forest and Bird to undertake research to help inform the development of an environmental strategy for fisheries. The research identified six key fisheries issues about which environmental stakeholders were most concerned: the limited opportunities for public participation in fisheries management; gaps in information, monitoring, and research capacity; a lack of precaution and environmental assessment in decision-making; the lack of a spatial and ecotype approach to policy and planning; the dominance of the private property-right approach; and the lack of recognition of non-extractive use values (ECO and Forest and Bird, 2001).

The research asked respondents to rank fishing impacts in terms of their priorities for management, which resulted in high rankings

for the depletion of fish stocks (96.3% ranked this as a high priority), followed by trawling on seamounts (91.6%), marine mammal by-catch (79.6%), trawling on the seafloor (79.3%), and dredging for shellfish (79.1%). In terms of opportunities for environmental stakeholders to work with tangata whenua and other fisheries stakeholders to achieve shared environmental goals, the research identified "a strong preference for an open process, accessible to everyone who wants to take part" (ECO and Forest and Bird 2001).

More recently, in 2015, submissions lodged by the sector to the MPI Fisheries Review process identified a similar range of issues. For example, WWF New Zealand identified three fundamental challenges facing fisheries management in New Zealand: incomplete and limited information; dated theories and frameworks for management and decision-making that fail to embrace ecosystem-based

fisheries management; and a flawed purpose and objectives, which focus primarily on utilisation rather than on the sustainability of natural resources. WWF New Zealand argued that a precautionary approach should be incorporated into the legislation and that action on matters such as benthic protection, protecting representative habitats, and reducing by-catch of protected species should be improved (WWF New Zealand, 2015).

ECO identified similar issues in its submission, including, amongst other things: the need to implement ecosystem-based management, the precautionary principle, higher bottom lines for fish stocks (such as 75% of virgin biomass for prey species and 50% for predator species), benthic impact assessment standards, better protection of benthic species, marine mammals, and seabirds, and greater spatial management and public participation (ECO, 2015).

## Public confidence in the fisheries management system has declined over time.

public opinions on marine fisheries management in New Zealand. Respondents were asked to rate the performance of fisheries management across five areas: limiting overall catch and rebuilding fish stocks in your area; limiting industrial scale fishing in inshore areas; fairly allocating catch entitlements between sectors; reducing by-catch of protected species; and reducing the dumping of excess or unwanted catch. Unsatisfactory performance ratings were significantly higher than satisfactory performance ratings for all areas. Limiting overall catch and rebuilding stocks received the highest performance rating, while reducing unwanted catch dumping was rated the lowest. Seventy percent of respondents thought that an independent inquiry into fisheries management and the quota management system was needed (Horizon Research, 2016).

### Māori Perceptions of Fisheries Management

As described in Section 3, iwi are major participants in and beneficiaries of the QMS. The Māori also participate in both customary and recreational fisheries, and, as has been noted previously, there remains little effective coordination of management among these three systems. While comprehensive studies are lacking, a few studies have investigated the Māori kaitiaki perceptions on the effectiveness of fisheries management. Reversing the declines of stocks is a consistent concern and priority.

During the 2007-2009 fishing year, 94 people from local Māori communities were interviewed, all of whom had been involved in fishing locally for an extended period of time across the south and eastern coasts of the South Island. All interviewees described "either a decline in some local marine stock, reduced accessibility to some stock, ecosystem shift, degradation of resource habitats or a combination of these observations." There were occasional comments regarding the recovery of some inshore seafood stocks, but these were few and set among a picture of long-term decline. There was also concern about



Māori waka (canoe)  
fragment

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restricted access to important inshore species as a result of overexploitation, particularly for elders and those without expensive equipment. The major shift was commonly recorded as occurring during the 1970s (McCarthy et al., 2014).

A later study, published in 2012, interviewed 22 kaitiaki from 14 tribes on the North Island and drew on 86 interviews with Ngāi Tahu on the South Island. It identified a range of cultural impacts from the perceived depletion of valued species. Respondents reported a loss of food species, which undermined the ability of hapū to offer hospitality at marae, as they had in former years. Species depletion and the imposition of harvesting bans also prevented harvesting practice, thereby causing a loss of traditional knowledge such as the understanding of life cycles, species management, and food-harvesting methods. Respondents expressed concern that

locally specific knowledge and skills were no longer used and were therefore no longer able to be passed on to subsequent generations. The decline in fisheries is also impacting the passing on of stories and knowledge that were part of the communal experience of collecting, preparing, and eating local foods.

Younger generations now have less familiarity with the foods that are part of tribal tradition, less understanding of how to prepare them, and less knowledge about their broader ecology. Ultimately resource depletion affects iwi and hapū identity (Dick et al., 2012).

Vintage fishing boats  
in Westport harbor,  
New Zealand

© Ralf Broskvar



## Changing Perceptions About New Zealand's Seafood Industry

Seafood New Zealand, the trade group for New Zealand's fishing industry, has recently (2017) launched a multifaceted campaign to bring positive information about New Zealand's commercial fisheries and fishers into the public eye. This effort is aimed at changing how New Zealanders perceive the seafood industry. As part of this initiative, the industry has adopted a code of conduct, commissioned a report to quantify the economic contribution that the fishing industry makes to the New Zealand economy (Williams et al., 2017), and brought to life through video the stories of the people who make their livings from fishing.

### New Zealand Seafood Industry Code of Conduct

[www.seafoodnz.co.nz](http://www.seafoodnz.co.nz)

- We do not condone illegal behaviour.
- We will work with Government and other interested parties to develop and implement principled and practical policies to ensure the use of fisheries resources is sustainable.
- We will continue to actively minimise our impacts on the marine environment and encourage others to act similarly.
- We will continue to invest in science and innovation to enhance fisheries resources and add value.
- We look after our people and treat them fairly.
- We will be accountable for delivering on Our Promise and will support increased transparency.

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