

Self governance in New Zealand's developmental fisheries: deep-sea crabs

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1. INTRODUCTION: DEVELOPMENTAL SPECIES AND THE QMS

In 1986, 27 species were introduced into the New Zealand (NZ) Quota Management System (QMS), a system used to manage commercial fisheries on the basis of individual transferable quotas (ITQ). QMS implementation gained new momentum in 2001 when many more species were introduced into the QMS as the *1996 Fisheries Act* was fully implemented. By October 2003, there were 62 species in the QMS and today there are over 100 species managed within this framework.

ITQs and 'deemed values' are the key regulatory measures used to maintain the sustainability within the QMS. At the beginning of each fishing year, quota owners receive "annual catch entitlements" (ACE), which provide authorization to land an amount of fish equal to their respective share of the TAC. Deemed values are civil penalties paid to the Crown for landing fish without ACE. The QMS has evolved into a hybrid system that employs both quantity (ITQ) and price instruments (deemed values) to control catch (Newell 2004).

In the past, initial quota allocations for a QMS species were made to fishers on the basis of their catch within a specified period ("catch history"). When the historical catches resulted in allocations less than the initial commercial catch limit, the remaining quota went to the Crown. The Ministry of Fisheries (MFish) sold this remaining quota by an open public tender.

Following changes in 2004, quota for all future species introduced into the QMS was, with some limited exceptions, subject to a tender process rather than allocation by catch history. For Maori, the Treaty of Waitangi settlement (the Treaty) ensured twenty percent of all new quota species and ten percent of all species allocated pre-Settlement would either be held or purchased by the Crown and made available to Iwi¹.

The change from catch history allocation to public tender is consistent with the New Zealand government's view that the QMS is integral to avoiding over-investment in fishing vessels and overfishing. Since 1992, MFish has constrained new fisheries development by a moratorium on new non-QMS permits. The permit moratorium prevented the expansion of non-QMS fisheries prior to QMS introduction, avoided the creation of incentives to 'race for catch history' and mitigated risks for stock sustainability. It has been argued that the prolonged permit moratorium has created some management issues, such as inhibiting the development of new and under-developed fisheries. The introduction of new species into the QMS via public tender

¹ Iwi are the largest everyday social units in *Maori society*; in many ways its meaning is analogous to that of tribe or clan.

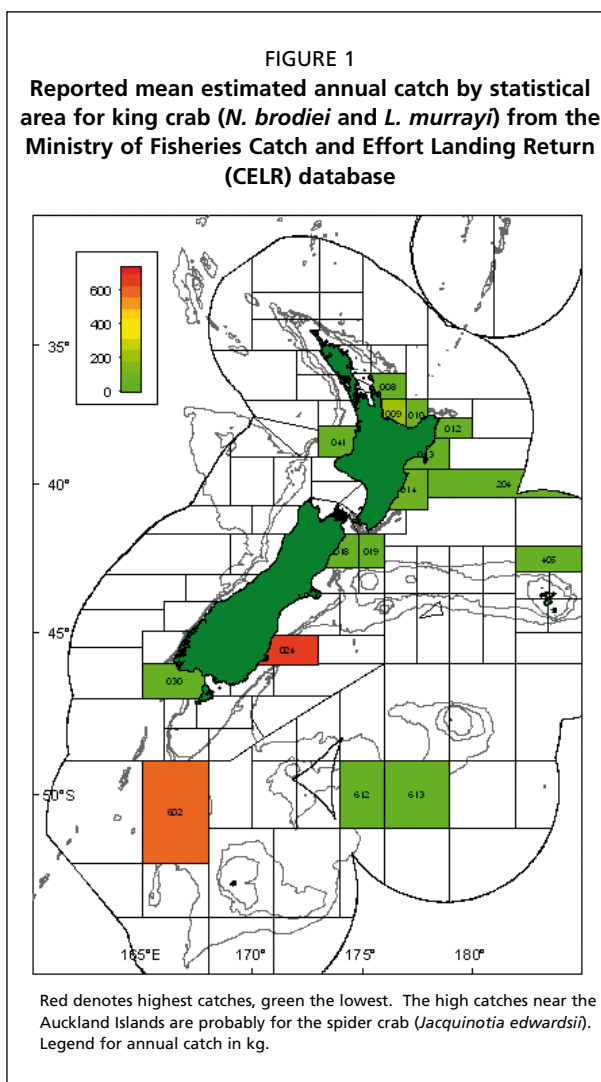
has, however, created an opportunity for more New Zealanders to become involved in developmental fisheries.

Devolution of management functions and responsibilities remains a central issue for New Zealand fisheries management. In 1992, MFish devolved the delivery of administrative registry services to an Approved Service Delivery Organisation, FishServe (see Harte, this volume). The broader devolution of fishery management services, where rights holders have primary input into setting their own regulatory controls, is still to be considered fully. Some piecemeal devolution of fisheries management responsibility has occurred. The company Challenger Scallops, in particular, is a notable example of how self-management can work (see Mincher, this volume). But the current New Zealand government is, at best, sceptical of further devolution of core fishery management services and, at worst, may be strongly opposed to such devolution. The developmental fisheries may present an opportunity to re-open this question in the context of fundamentally new governance institutions.

These developmental fisheries also challenge industry to design institutions to share in management of the resource, as envisioned by Scott (1988). A framework for collective action is required to manage resources sustainability. Developmental fisheries are an opportunity for rights holders to address these challenges by implementing robust governance and planning frameworks from the outset.

In one developmental fishery, the deep-sea crab fishery, the rights holders have developed a governance framework to focus on collective objectives throughout the

entire value chain, from harvesting, processing, and marketing to fisheries management. A corporate structure, Crabco Ltd (Crabco), was created to develop, commercialize and maximize value in the fishery. This paper examines the potential gains from the cooperative management, collective action and self-governance by rights holders of this quota.



2. DESCRIPTION AND HISTORY OF FISHERY

2.1 Biology

The fishery is characterized by landings of king crab (including *Neolithodes brodiei*, *Lithodes murrayi*, and *L. longispinus*), red crab (*Chaceon bicolor*) and giant spider crab (*Jacquintia edwardsii*). King crabs and red crab tend to be found in similar habitat in moderate to deep waters. King crabs from the east coast of the North Island to southern parts of the Campbell Plateau and red crabs north of the Chatham Rise. Spider crabs live at depths from the intertidal to 550 metres and have been found predominantly in southern New Zealand waters. Figures 1 and 2 show the reported mean estimated annual catch by statistical area for king crab (*N. brodiei* and *L. murrayi*) and red crab (*Chaceon bicolor*) respectively for the years 1993 through 2001. The high catches of king crab near the Auckland Islands are probably

misidentification of the giant spider crab (*Jacquinitia edwardsii*).

Little is known of the biology or behaviour of these species. It is thought that king crabs and spider crabs may aggregate, juveniles forming large mounds presumably for protection and adults doing the same during breeding and moulting periods. The migratory nature of these crabs also suggests they move from deepwater offshore to the intertidal areas to breed. For spider crab, this has become particularly observable around the Auckland Islands, as it has been seen as bycatch in scampi trawling and other fishing activity along their migration route.

2.2 Previous investigations

King crabs were the focus of exploratory fishing (potting) permits in 1996 and 2001 and red crab in 2001. Significant quantities were found of all species. The reported landings for king crabs and red crabs between 1993 and 2001 are outlined in Table 1. The catch landing records show only small amounts or reported catch except during 1996 and 2001 when landings were augmented by catches made under the special permit.

The giant spider crab has been the subject of a number of investigations. The first recorded exploratory fishing occurred in the early 1960s in the Auckland Islands and Pukaki Rise areas. Since that time there have been at least three other investigations. The Japanese assessed their commercial potential in 1964-65 and regularly fished giant spider crab between 1968-1974. Two Russian vessels were thought to have fished for giant spider crab during 1976-78 on behalf of a Japanese company.

In 1970, a consortium of South Island processors commissioned work to assess the feasibility of a New Zealand-based commercial industry for giant spider crab. As a consequence of this work, an MFish

report suggested that a limited licence fishery of up to three processor vessels should be permitted into the fishery (MAF 1973). Finally, in 1991-92, a New Zealand fishing company exercised a special permit to undertake investigative research. Catch and landing records from this investigation reported greater catch per unit effort (CPUE) than indicated in the Japanese CPUE records. Partly as a consequence of the permit moratorium, there was little other interest in the fishery until 2001-02, when increased landings were reported as bycatch in the scampi trawl fishery. It was thereafter considered as a developmental fishery to be brought into the QMS. (See Table 2 for a history of landings of giant spider crabs.)

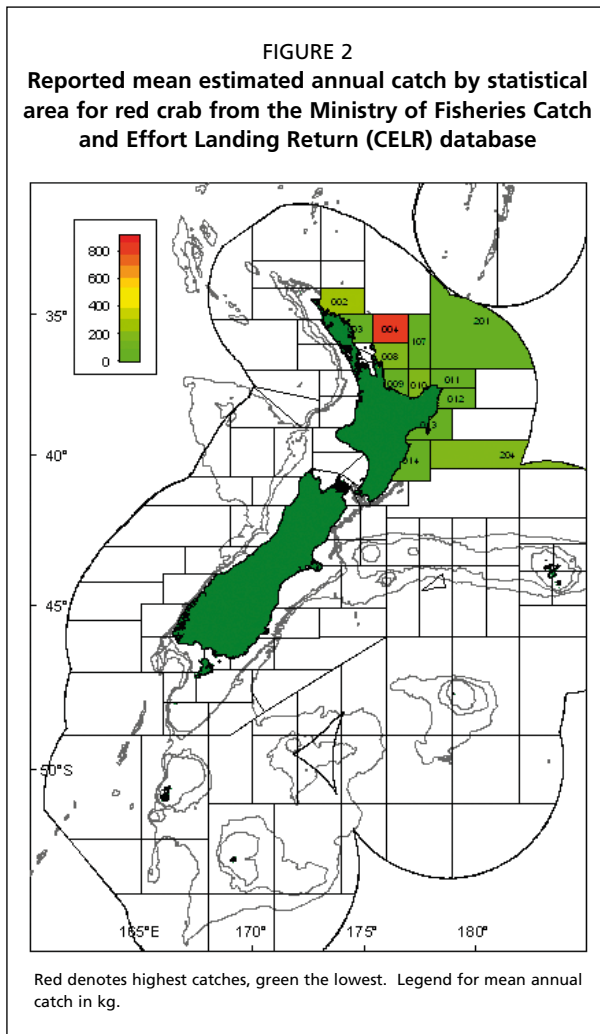


TABLE 1
Reported landings (tonnes greenweight, catch landed and/or discarded) for king crab and red crab

| Fishing year | Catch (king crab) | Catch (red crab) |
|--------------|-------------------|------------------|
| 1993-94 | 55 | 0 |
| 1994-95 | 64 | 0 |
| 1995-96 | 0 | 0 |
| 1996-97 | 4 126 | 0 |
| 1997-98 | 80 | 0 |
| 1998-99 | 1 | 0 |
| 1999-00 | 10 | 0 |
| 2000-01 | 154 | 5 |
| 2001-02 | 1 247 | 1 951 |

Source: MFish 2004a.

TABLE 2
Reported landings (tonnes greenweight, catch landed data) for giant spider crab

| Fishing year | Catch |
|--------------|--------------------|
| 1968–69 | >1 200 |
| 1969–70 | .. ¹ |
| 1970–71 | .. ¹ |
| 1971–72 | .. ¹ |
| 1972–73 | 2 552 ² |
| 1976–77 | .. ³ |
| 1977–78 | .. ³ |
| 1988–89 | 0.01 |
| 1989–90 | 0.13 |
| 1990–91 | 24 ⁴ |
| 1991–92 | 14 ⁴ |
| 1992–93 | 2 |
| 1993–94 | 3 |
| 1994–95 | 3.30 |
| 1995–96 | 21.08 |
| 1996–97 | 18.35 |
| 1997–98 | 9.40 |
| 1998–99 | 12.79 |
| 1999–00 | 25.55 |
| 2000–01 | 72.10 |
| 2001–02 | 180.39 |
| 2002–03 | 195.93 |

Source: MFish 2004a.

".." indicates no data available.

- ¹ Fishing by up to three Japanese vessels on Pukaki Rise (catch unreported).
- ² Catch estimate from Pukaki Rise by Japanese vessels.
- ³ Fishing by up to two Russian vessels on Pukaki Rise (catch unreported).
- ⁴ Fishing by special permit –NZ Seafood Company (catch records incomplete).

3. CRABCO

In 2006, deep-sea crab, including giant spider crab, red crab and king crab were brought into the QMS through open tender (MFish 2004a). All Crown quota was allocated to the highest bidder through tender. Due to the 2004 changes to the Fisheries Act, there were no allocations based on catch history. Four New Zealand entities that acquired 90 percent of the shares in the tender helped facilitate the development of Crabco. This included the 20 percent allocated to Te Ohu Kai Moana (TOKM) under the Waitangi Treaty. The TOKM was established under the *Maori Fisheries Act 2004* to advance the interests of iwi individually and collectively, primarily in the development of fisheries, fishing and fisheries-related activities. The remaining ten percent was initially purchased by an entity that acquired the quota to balance their bycatch in the orange roughy and scampi fisheries. However, they have recently acknowledged the value in developing deep-sea crabs as a target fishery and have begun to participate in Crabco meetings.

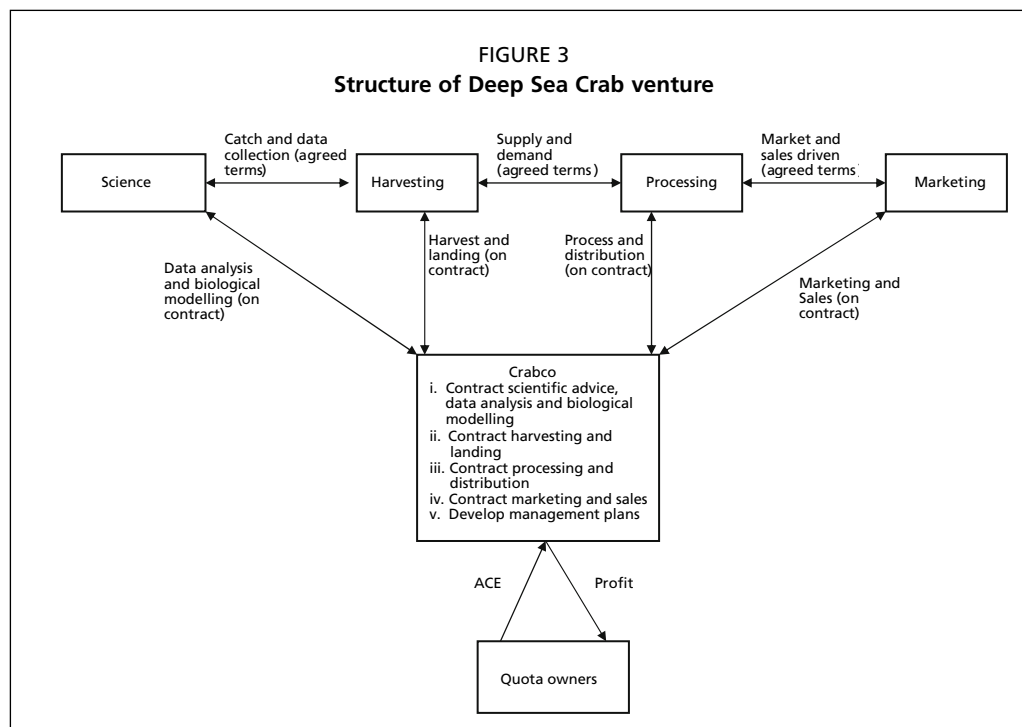
The goal of this joint-venture was to maximize the long-term productivity of stocks and to add quota value by determining if the biological characteristics of the species could sustain higher catch limits. When the rights were first tendered, the TACs were set at low levels to reflect the low knowledge of the biological characteristics of these fisheries. By increasing the TAC and enhanced robust scientific research and accurate fine scale catch and landing reporting, Crabco would increase the value of participants' quota holdings. The company began harvesting king crabs and red crab in May 2007 against a harvest plan that was designed to

collect data that would help estimate abundance and distribution across different spatial and temporal scales. Crabco intends to target giant spider crab in mid-2007.

Most deep-sea crab quota owners have previously acquired other quota species and been involved in their development in New Zealand. They learnt that without a devolved fisheries management process, unnecessary economic costs and sub-optimal fishing rules would be imposed. Self management of the fishery was necessary for these rights holders to make collective decisions about fishing patterns and fishing rules, enhancement projects, exploratory fishing and research. The deep-sea crab quota owners see the economic benefits of good fisheries management and the importance to review and monitor TACs, deemed values, and other fishing rules for improved quota value.

In order to achieve their objectives, the quota owners agreed that a new management model was necessary. The Crabco model was developed on the premise of a sole owner, where quota owners entrusted the management of their rights to the company specifically geared towards maximising quota values. The Crabco joint-venture model has participants transfer their ACE to the company at the beginning of each year. The joint-venture is then responsible for delivering optimal governance arrangements and operation, including the following.

- i. Planning, both annual and strategic. Plans are signed off by shareholders prior to implementation.
- ii. Internal and external communication, including liaison with MFish officials over administrative and regulatory requirements.
- iii. Planning and contract management for harvesting and processing.



- iv. Planning and contract management for the provision of marketing services.
- v. Quality assurance in operational delivery.

Figure 3 presents the relationships between Crabco, its owners, and its suppliers.

Crabco intends to maximize its profit for shareholders throughout the harvesting, processing, marketing and fisheries management value chain. It returns its profits to its ACE holders through a transparent accounting process. Economic analysis and reporting on the quota value is provided to all shareholders and all profits are distributed to quota owners as specified in the ACE transfer agreement.

The price, paid to each quota owner for the transfer of their ACE after the end of each fishing year is the amount equal to all profits earned on that quota owner's ACE during that year. This means that quota owners can own differing percentages of different species. The area of the New Zealand fishery was divided into nine Quota Management Areas, of which the rights for king, red and giant spider crab were tendered in each QMA as separate entities.

Profits are calculated separately for each species, and are equal to total revenues from sales of that species less all costs for that species. These costs include costs for harvesting, processing, marketing, and resource management and research. Profits for each species are then divided among the quota owners in proportion to their share of ACE for that species that each quota owner transferred to Crabco at the beginning of the year.

Under the governance framework, each quota owner will own one share of Crabco, regardless of the amount of quota held. No person can be a shareholder unless they are also a deep-sea crab quota owner. If shares in Crabco are transferred, quota must also be transferred to the same person. If a quota owner wishes to transfer their quota, other deep-sea crab quota owners in Crabco must first be offered that quota at the price offered by any third party. Quota owners have made a commitment to a two-year development phase where all participating quota owners' transfer their ACE into the single management company. Any profits generated during that period are to assist in further development of the fishery.

A quota owner's voting share, on an annual basis, is proportional to the value of the ACE sold by that quota owner to Crabco the previous year. Voting rights for the

current year will depend on the price paid for that quota owner's ACE in the previous year. For example, if a quota owner received 25 percent of Crabco's 2008 profit as the price for the ACE sold at the beginning of 2008, that quota owner will have 25 percent of the voting rights during 2009. Voting rights for the first year of trading were determined according to budgeted projections of profit share.

Quota owners are also entitled to appoint representatives to the board of directors in proportion to their voting rights: a minimum of 10 percent of the voting rights equals representation by one director.² A board of directors has responsibility for the day-to-day management. This board prepares an annual budget and business plan each fishing year. The budget and business plan set out the contribution/levy required to be paid by each quota owner to fund operations for that financial year.

With the establishment of Crabco, the joint-venture partners immediately began developing a management plan for the deep-sea crab fishery. The company acts as a representative of all quota owners and liaises with relevant governmental entities on a regular basis with a view to playing a larger role in management of the fishery. The establishment of Crabco has created a keen (and aligned) interest in protecting fishery rights held within the company against those who may threaten or diminish their value. The prospect of the rights holders, accepting management and development responsibilities rather than simply harvesting fish, presents a new frontier of opportunities. Self-management is being seen as a crucial step for the future development of the fishery.

All stakeholders, including contract harvesters, have agreed to provide scientific information freely, in order to enable better and more informed management advice. Under their contract, harvesters are to record fine-scale catch and landing information. There has also been more support for management decisions through the internal process and quota owners have readily agreed on self-imposed fishing rules. Crabco directors expect that this will improve compliance and make service delivery more efficient. These rules have provided more surety for long-term planning for future projects, as seen in the improved quota value in recent trades.³

Internalizing fisheries management has engendered industry ownership of difficult decisions and encouraged technological innovation to manage environmental, biological and economic concerns. In particular, quota owners have agreed to use only crab pots, rather than trawling, to minimise environmental impacts. Crabco members have also supported a recent increase in the deemed values, which will not only deter free riders from entering the fishery but also help manage bycatch in the scampi fishery. Scampi fishers will probably need to buy ACE for the spider crab landings, which will create an incentive for those fishers to avoid or mitigate their bycatch.

4. EVOLUTION OF FISHERIES GOVERNANCE

In New Zealand, the recent tender of Crown-held quota in new and developing fisheries has provided a perfect opportunity for self management. For deep-sea crabs, the development of Crabco has enabled more efficient, responsive and targeted management decisions that can benefit the rights holders and the fishery as a whole.

However, while ITQs can facilitate the economic efficiency of fishing, this also depends on other processes that encourage quota owners to assume additional management responsibility. This includes government devolving responsibility for, and authority over, fisheries management to resource users and other rights holders to encourage the industry to take more responsibility in managing crab stocks.

² This point was included in the Shareholders Agreement so that one director could represent the many Iwi who individually would own only small parcels of quota once the TOKM has allocated the 20 percent Maori quota share as part of the Treaty Settlement.

³ Towards the end of 2006, within a 10-month period of deep-sea quota being tendered by the Crown, a quota owner sold a significant share of their quota to another Crabco participant with a 75 percent capital gain.

To facilitate the shift to self-management, governments need to provide the institutional framework that enables quota-holders to manage their own affairs so the core responsibilities for each of the stakeholders can be defined. This step will require a common plan by government and industry. While the New Zealand Government has made some initial steps toward devolution, in recent times it has been at best ambivalent about further devolution. In this context, allowing stakeholders a greater role in fisheries management will be, and has been, difficult to implement. The uncertainty around the proposed framework for fisheries management plans (MFISH 2004b, 2007) has resulted in a period of inertia where little advance has been made on self management issues.

Early attempts at self management in other fisheries were not fully successful in part because the roles and responsibilities of stakeholders were never fully defined and because capacity transfer was not implemented to support the new rights owner roles and responsibilities. The Ministry was also reluctant to suspend existing management approaches while the new concepts evolved. This resulted in dual regimes, where industry was required to cover the costs of both. Rights holders have also questioned whether a group functioning as a sole owner of a fish stock, or group of associated fish stocks, should continue to apply fisheries management rules that have become entrenched in the fishery but have been shown not to work.

Managing the resource as a sole owner (Scott 1955) has challenged rights holders within Crabco to revisit traditional industry paradigms (e.g. anti-government and competitive fishing behaviour) and embrace instead a culture of collective value maximization. This value maximisation is delivered through contractual agreements for research, harvesting, processing, and marketing, which are funded through the annual business plan. The underlying objective of the business plan is to add value to the property rights.

The pursuit of collective objectives provides an opportunity for rationalisation of rights ownership, technology advancement, harvesting and processing efficiencies, joint market and product development, co-ordinated responses to common externalities, and, most importantly, increased data collection and information sharing. Targeted research can improve management by adopting finer scale management projects and managing environmental externalities at rates that exceed expectations of government. Crabco presents industry and government with fundamentally new choices in the use and management of fisheries resources.

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