

Rock lobster management in New Zealand: the development of devolved governance

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1. INTRODUCTION

A critical issue for fisheries management is why devolved governance arrangements develop and how the characteristics of the devolved governance organisation influence its success. Competing theories also seek to explain why devolved governance (self-management or co-management) organisations exist. A large portion of the co-management literature argues that these shared management regimes grow from long-lived community-based regimes. Closely linked are the concepts of social capital and civic engagement. However, it is also argued that the devolved governance arrangements can develop out of strong property rights regimes that provide incentives to take on co-management or self-management responsibilities.

Management of New Zealand rock lobster (*Jasus edwardsii* [Photo 1] and *Jasus verreauxi*) provides an important example for understanding these issues. Because of the rock lobster's history as a set of localised fisheries, an extensive history of local and national cooperation existed prior to the introduction of individual transferable quotas (ITQs) into rock lobster management in the 1980s. However, ITQs and their associated property rights created an incentive structure that encouraged the development of strong regional and national organizations, which work with the New Zealand government to co-manage the lobster fisheries. This case shows a combination of industry activity (at the local and national level) and strengthening property rights as the key to the development of devolved governance in the New Zealand rock lobster industry.



NZ ROCK LOBSTER INDUSTRY COUNCIL

PHOTO 1

New Zealand rock lobster, (Jasus edwardsii)

2. THEORIES OF DEVELOPMENT OF DEVOLVED GOVERNANCE

Within the co-management literature, two routes to the development of co-management regimes are described: evolutionary and crisis-driven. Evolutionary development occurs when long-lived institutions based in local communities (e.g. traditional or indigenous management regimes) become interwoven with the existing central or regional government (e.g. Honneland and Nilssen, 2000; Lim, Matsuda and Shigeni, 1995; Jentoft, 1989). For example, use of traditional gear or catching rules may be incorporated into laws, as often happens in the Maine lobster fishery (Acheson, 2003). The co-management literature also suggests that, in the absence of evolutionary development, co-management approaches are most likely to be adopted when there is a period of extreme stress (e.g. Pinkerton, 1989). Pomeroy and Berkes (1997) have argued that a broader set of crisis-oriented conditions can lead to development of co-management. These include: resource deterioration, conflict between stakeholders, conflict between management agencies and the local fishers, and governance problems in general.

Social capital is another important concept in understanding why institutions arise and succeed. Putnam (1993) defined social capital as “features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated action.” Ostrom (1990) argues that early success with smaller, localised institutions builds the social capital for future, larger developments by providing a situation where people learn how to work together to maintain a resource and an institution. “[T]hey can learn whom to trust and what effects their actions have ... When individuals ... have developed shared norms and patterns of reciprocity, they possess the social capital with which they can build institutional arrangements.” (Ostrom, 1990) Thus, over time, an iterative process allows incrementally larger organisations to develop.

When individuals or groups of resource users have a strong set of property rights to a common pool resource, the security provided by the property rights creates the incentive for them to manage the resource sustainably over a long period of time (Ostrom and Schlager, 1996). This linking of property rights and governance has important implications for developing co-management regimes. Scott (1993, 2000) makes the argument specifically for ITQs. He (1993) argues that once ITQ regimes are set up, self-governing fisher organizations are likely to succeed, as they are better able to work together without fear that their share of the resource will be diminished. There is evidence in the case of New Zealand that, at the national level, the processes theorized by Scott have indeed taken place (Yandle, 2003).



PHOTO 2
Typical lobster fishing vessels - Island Bay, Wellington



PHOTO 3
In many exposed areas, the vessels are beached when not in use – Ngawi, Cape Palliser



PHOTO 4
Setting a lobster trap – bait in the trap is just visible

3. THE NEW ZEALAND ROCK-LOBSTER FISHERY

Rock lobster catching is integral to the history of New Zealand. The Maori, who arrived in New Zealand in the 10th to 14th centuries (Reed, 1970), consider rock lobster to be historically and culturally important. Rock lobster was an important export species as early as the 1940s and 1950s (Annala, 1983a). However, development varied regionally. In the Chatham Islands, rock lobster were known and fished on a small scale as early as 1907 (Kensler, 1969). But the Chatham Islands lobster boom did not start until 1965 when one boat landed two tonnes of rock lobster (Annala, 1983a) and heralded in the short-lived “Crayfish Bonanza” (Arbuckle, 1971). Similar, but less dramatic, booms and busts occurred in other localized fisheries. Photos 2 and 3 show typical vessels used in this fishery.

Rock lobster is harvested with lobster pots boats with one or two crew (Photo 4). Rock lobster is essentially an export species, primarily shipped live to the Asian markets, although some is also sold frozen to the US. It is the third largest export species, accounting for NZ\$127 million in 2006 (SeaFIC, 2007). Total allowable commercial catch (TACC) for the 2006/2007 season is set at 2 766.6 tonnes, a sustainable catch level set by annual stock assessment (NRLMG, 2006). Recent fishery stock assessments broadly describe fisheries that are stable or recovering from previous over-fishing, although they caution that large degrees of uncertainty remain due to incomplete information on recreational catches and the degree of illegal fishing activities (NRLMG, 2002; NRLMG, 2001a).

4. HISTORY OF ROCK LOBSTER MANAGEMENT

4.1 Overview

Boom and bust cycles characterised much of the historical record of this fishery (1945–2002). This is illustrated in Figure 1, where after an initial run-up in catching during the late 1940s and early 1950s, several peaks and valleys are evident in both the catch and catch per unit of effort (CPUE) for the national fishery. Data presented in this figure do not include that for the Chatham Islands. The Chatham Islands have a distinctive history and Chatham Islands rock lobster is treated as a separate stock. Since the introduction of regulation in 1937, managerial efforts have focused on maintaining the

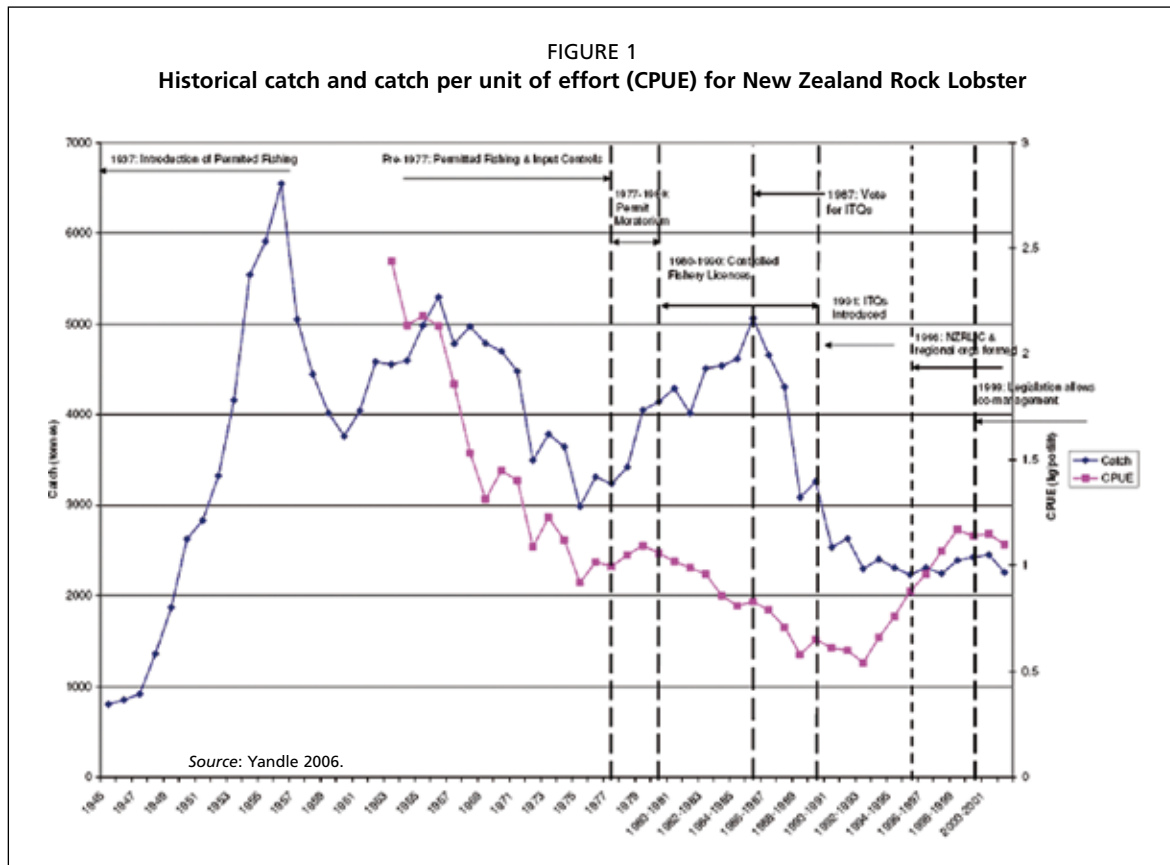


TABLE 1
Key Events in Development of Rock Lobster Devolved Governance

Years	Event
1937–1980	Permitted Fishing & Input Controls – fishing permits required but freely distributed. Considerable input and method controls.
1977–1979	Moratorium on of new permits
1980–1990	Controlled Fishery -- Fishery Licensing Authority issued limited number of fishing licences to approved commercial fishers
1986	QMS introduced into finfish & paua (abalone)
1991	Introduction of rock lobster into QMS – TACCs less than catch histories
1991–1993	TACC Cuts in some areas
1991	National Rock Lobster Steering Group – 10 year plan
1992	Start of National Rock Lobster Management Group (NRLMG)
1993	CRA3 initiative to cut TACC in exchange for other management changes.
1996	Formation of CRAMACs and NZ RLIC, formation of SeaFIC
1997	NZ RLIC becomes research provider to ministry. Continues to today.
1999	Legislation passes allowing fishery management plans/co-management

biological and economic viability of the fishery. Managerial approaches have included: licensing, catching method restrictions, limited entry, ITQs and devolved governance (or co-management). Table 1 provides a summary of this history and related events.

Within the rock-lobster fishery, there is one national set of regulations and TACC for packhorse lobster (*Sagmariasus verreauxi*), but the dominant rock lobster species (*Jasus edwardsii*) is divided into nine regions (See Figure 2). Note that CRA 10 is defined administratively, but has no commercial landings. These regions correspond with the regional rock lobster industry organizations, “CRAMACs” (derived from “Crayfish Management Advisory Committee), which are key to rock lobster co-management in New Zealand.

4.2 Permitted fishing and catch restrictions: 1937–1980

Annala (1983b) marks regulation as beginning in 1937 with the introduction of fishing permits, when rock lobster fishing licences were first required. Subsequently, input controls and method restrictions were introduced, which included: size limits (often varying by regions); bans on taking of egg-laden females; bans on taking of soft-shelled lobster; seasonal limits; bans on use of SCUBA equipment; escape gap requirements; and area closures. While the fundamentals of the permitted fishing approach remained a constant, the frequency of changes to input controls and method restrictions was dizzying. Indeed, Annala (1983b) documents approximately 60 changes to commercial and recreations catching regulations during this time period.

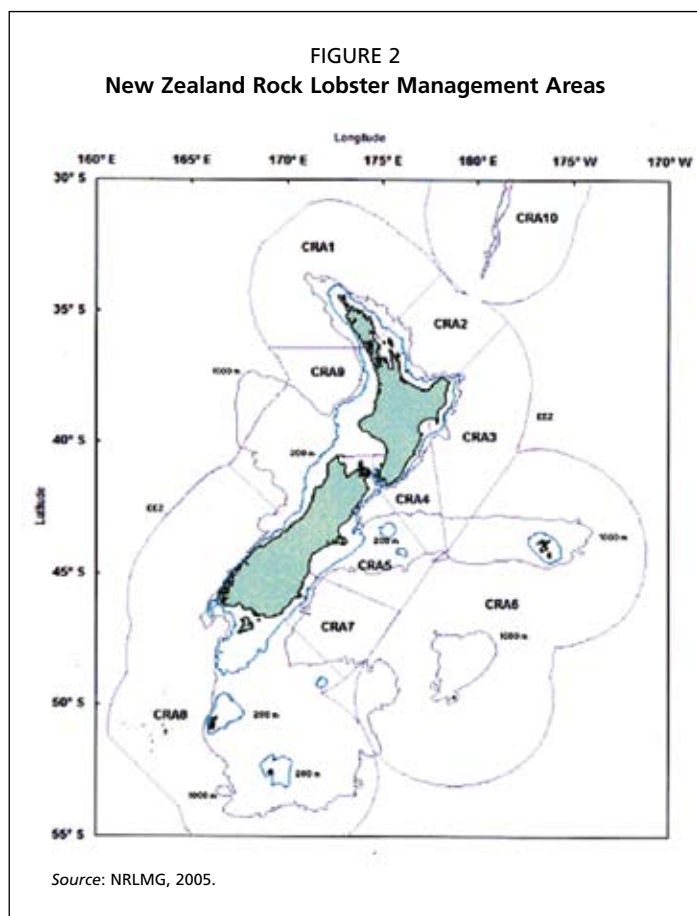
Concerns about the use of fishing permits as a management approach arose in the 1970s after a rapid decline

became evident (see Figure 1). It was decided to institute limited entry, a decision that had broad agreement from the Federation of Commercial Fishermen, the Fishing Industry Board and the Ministry of Agriculture and Fisheries. The Fishing Industry Board acted in an advisory and advocacy role for the entire fishing industry. It was empowered to levy the industry to pay for its activities. In 1997, the FIB was replaced by the New Zealand Seafood Industry Council [SeaFIC], which retains its levying authority, but has a substantively different organizational structure. *The Fisheries Amendment Act of 1977*, or the *Controlled Fisheries Act*, was passed, which resulted in an immediate moratorium on new permits. The moratorium remained in place until 1980 when the controlled fishery policy was introduced in the document “Policy Statement for the Rock Lobster Controlled Fishery” (Annala, 1983b).

4.3 Rock lobster as a Controlled Fishery: 1980–1990

As a “Controlled Fishery,” rock lobster fishing permits were distributed by the Fishing Licensing Authority (FLA). In issuing permits, priority was given to fishers who had a long-term documented commitment to the fishing industry and earned at least 80 percent of their income from fishing in general. Note that 80 percent of income was required from fishing in general, not just rock lobster fishing. The number of commercial rock lobster fishing permits issued nationally dropped 38 percent, from 1 574 vessels to 970 vessels (Annala, 1983a). Through natural attrition, the FLA was further able to reduce effort in the fishery.

The controlled fishery divided New Zealand into ten geographically distinct fisheries, with permits usually restricted to one region. The Fishing Industry Board (FIB) organized a liaison committee for each region consisting of fishers and processors who provided industry input into regional fishery management. A national



liaison committee composed of representatives from each region also was created. The formation of these regional and national liaison committees was a critical step towards the development of co-management in the rock-lobster fishery.

4.4 Introduction of rock lobster into the QMS

While the rock-lobster fishery continued under controlled management until 1990, the 1980s marked a period of fundamental change in the broader New Zealand fishing industry. In 1986, New Zealand became one of the first countries to adopt market-based regulation when it instituted its Quota Management System (QMS). The emphasis on ITQs, on the removal of subsidies, and on the promotion of exports is viewed as a seminal and long-standing example of the market-based approach to fishery management.

Rock lobster was not included in the initial rollout of the QMS. According to Sykes (2003), the Ministry of Agriculture and Fisheries originally approached the New Zealand Federation of Commercial Fishermen in the early 1980s and sought to use paua (abalone) and rock lobster as pilot species for introducing ITQ management. However, the Federation rejected this proposal because the fishery appeared healthy, and the Federation was wary of a system entailing a total allowable catch (i.e. a catch limit). Thus, QMS was initially introduced in the broader finfisheries first. In the mid 1980s, as pressure on stocks continued to grow, the issue of bringing rock lobster into the QMS was re-examined.

Discussion first took place at the national level through the National Rock Lobster Liaison Committee. As background, the FIB prepared the report “New Zealand’s Rock Lobster Fishery: A Fishery at the Crossroads” (Duncan, 1985), which outlined multiple options but centred on how rock lobster could be brought into QMS. MAF prepared a booklet, “Rock Lobster Fisheries Proposed Policy for Future Management” (MAF, 1986a), which outlined four policy options: (a) the existing system, (b) transferable licences, (c) transferable pot entitlements and (d), ITQ management. After a series of public meetings, the Federation of Commercial Fishermen held a vote in October 1986 on the four policy options. This ballot showed no single policy option receiving majority support. ITQ management received only 21 percent support, while transferable pot entitlements received 39 percent support, and transferable licences received 34 percent support (Branson, 1986).

In the wake of this vote, in November 1986, a new round of consultation started. In the new MAF discussion booklet (MAF, 1986), the Minister of Fisheries removed transferable licences and transferable pot limits as options and made clear that the choice was between ITQs under the QMS and the existing controlled fishery with the addition of TACs. With the two most popular options removed and with TACs inevitable, it is perhaps not surprising that the second vote on 16 April 1987 showed that 71 percent of votes cast were for the ITQ system (Jarman, 1987).

The Ministry initially planned to bring rock lobster into the QMS in 1988, but Treaty of Waitangi fishery claims by Maori put a hold on the introduction of new species into QMS (see Moon, 1999). Rock lobster was finally brought into ITQ management as part of the *1989 Maori Fisheries Act*, for implementation in the 1990 fishing year. This one-year delay in implementation resulted in a year of “last hurrah” intensive fishing that can be seen in Figure 1 just before the ITQ introduction.

Introduction of rock lobster into the QMS required reductions in the TACC for the fishery. All regions received cuts that brought their TACC below their historical documented catch, with the Southern region receiving the largest cut of 35.1 percent and the Chatham Islands receiving the smallest cut at 20.9 percent (MAF, 1990a). Cuts in TACC were also introduced in subsequent years and were subject to organised discussion and contestation by national fisheries organisations.

Although the introduction of rock lobster into the QMS created a period of legislative stability, turbulence continued within the industry and regulatory system.

FIGURE 3
An example of recent advertisements for lobster quota and related goods

A O T E A R O A Q U O T A B R O K E R S

PAUA SHARES FOR SALE

PAU2 960kgs with ACE \$384,000
PAU2 1000kgs with ACE \$400,000
PAU4 2500kgs with ACE PAU4 1000kgs with ACE

PARCELS FOR SALE

SCH7 with ACE 3000kgs FLA1 18,000kgs with ACE
\$2000/ton
SCH5 1400kgs, HPB5 600 kgs with ACE KAH1 5000kgs with ACE
\$5000/ton
SPO8, SPO8, SCH7, SPD7 with ACE HPB5 1000kgs with ACE
PAD1, PAD7, PAD9 BNS3 5500kgs with ACE
\$15,000/ton
SNA1 4000kgs with ACE ANG 11, 14, 15 shares for sale
SNA1 10,000kgs with ACE SUR2A 2200kgs
BCO5 5000kgs with ACE
BCO5 30,000kgs - caught

CRAYFISH SHARES FOR SALE

CRA2 1000kgs CRA4 3000kgs – caught
CRA6 5000kgs – caught CRA7 1200kgs – caught
Some finance available with CRA parcels — enquire

QUOTA SHARES WANTED to purchase

CRA1 5000kgs CRA5 4000kgs
CRA9 5000kgs PAU4 3000kgs
CRAB 5000kgs PAU3 2000kgs

QUOTA SHARES WANTED to lease

BNS7, SNA1, HPB7, BCO4

NEW CRAY BOATS


23ft alloy Raglan through jet	\$25,000 + GST
33ft alloy jet boat through jet	\$220,000 + GST
11.4mtr alloy cray boat through jet	\$200,000 + GST
28ft glass cray boat through jet	\$53,000 + GST

All prices + GST

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NET PARCELS WE HAVE IT ALL



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www.aotearoaquota.com

Source: Seafood New Zealand

This turbulence focused around both the setting of total allowable commercial catch (TACC) and also a series of national and regional rock lobster industry initiatives on methods and approaches to maintain and improve the fishery. These events were important for their role in developing grassroots input and thus a co-management tradition or ethic within the industry and government. Just how far the QMS has developed is apparent from the recent advertisement shown in Figure 3.

4.5 Industry management advice and industry initiatives

In addition to discussing setting TACCs, industry participated in broader consultative processes surrounding rock lobster management at the national level and also initiated management proposals. The Rock Lobster Steering Committee was convened by Douglas Ladd, the Minister of Agriculture and Fisheries, in 1991 to develop a plan for rock lobster management (RLSC, 1991). The committee composition of commercial fishing, recreational interests, Maori interests, conservation groups and the Ministry of Agriculture and Fisheries was seen as a “shift towards a new management approach based on the direct involvement of user interests in the formulation of a forward looking fishery plan” (RLSC, 1991). The consultative process took a year to develop the plan. The final plan recommended that, rather than focusing on nationwide management with TACC reductions as the primary tool to rebuild lobster stocks, the strategy should be regionally focused and should use a variety of management tools. These would include crackdowns on illegal fishing, handling protocols and changes in size requirements. The committee recommended that management approaches be evolutionary and that a National Rock Lobster Management Group (NRLMG) be created to advise the Minister on rock lobster fishery management for the duration of the ten-year plan (RLSC, 1991).

In 1992, the National Rock Lobster Management Group was created and it continues through to today. The official composition includes all groups that participated in the Rock Lobster Steering Committee, but participation of the environmental representative is not consistent, and in 2001 concerns were raised about

the lack of customary Maori (as opposed to commercial Maori) representation on the NRLMG (NRLMG, 2002; NRLMG, 2001b). Over the last decade, the NRLMG has somewhat changed its perception of its role, from providing management advice to the Minister, to that of a user forum that encourages cooperation. (Compare, for example, statements of purpose in NRLMG [1993] and NRLMG [2002].) The group retains its position as primary management adviser to the Minister, so this change in vision has important implications for the strength and role of regional and national organisations in developing management approaches. It also reflects a series of initiatives that have taken place during the 1990s.

Since the early 1990s, the rock lobster industry, both at the national level and regional level, has engaged in a series of management efforts to stabilise or increase the rock lobster stocks and to enhance long-term revenue from the fishery. While these efforts have met with mixed success, they show a consistent pattern of industry involvement in, and often initiation of, innovative management practices. Some of these initiatives are summarized below.

- i. *Supplemental Enforcement Initiative*. In 1993, at the instigation of the rock lobster industry, the Ministry and the Fishing Industry Board contracted for additional enforcement to target illegal fishing in both the commercial and non-commercial fisheries, which was funded by the an additional levy of 0.5 percent on rock lobster catches. (The agreement fell apart after the Ministry received legal opinion that the contract was inappropriate for a government agency.)
- ii. *CRA 3 Harvest Strategy*. In the early 1990s, the CRA 3 stock was in significant decline. Commercial fishers worked with recreational and customary Maori interests to form the CRA 3 Users Group and to develop an innovative harvest strategy. The key elements of this proposal were: shelving (or agreeing to not harvest) 50 percent of the TACC for three years; closure of the CRA 3 fishery for three months to all fishers; increased enforcement targeted towards poaching; and decreasing the minimum catch size for male lobster from 54 to 51 mm (Branson, 1992). With some modification (most notably changing the tail length minimum to 52 mm), the Ministry accepted the harvest strategy, and elements of it remain in place today. While CRA 3 leadership now expresses concerns over the long-term success of the plan, it remains widely regarded as an important event that built momentum for co-management. It can be seen as an early, important example of fishers (commercial, recreational and Maori) actively engaging in governance activities and putting the long-term health and value of the fishery in front of short-term gains.
- iii. *Data Gathering Programmes*. Stock monitoring data are an essential component of rock lobster resource assessments. The rock lobster industry has progressively developed and implemented stock monitoring initiatives such as logbook programmes and electronic data collection and reporting programmes. The CRA 2 industry commissioned and funded an extensive lobster tag and release programme in 1996. The CRA 5 industry established a research committee that initiated commercial logbook programmes and tag and release programmes, and worked with the charter sector to develop a charter logbook programme (Wichman, 2004).
- iv. *No Tag/No Sale*. An ongoing problem is illegally caught lobster sold to the retail and hospitality trade. In conjunction with FIB, the rock lobster industry experimented with a programme to identify legally caught lobster with distinctive tags. The purely voluntary programme failed for multiple reasons including: resistance from retailers, consumers and restaurants (which had benefited from the lower prices on the black market), technical difficulties with the tags, and the lack of an enforceable regulatory framework. The programme was shelved after its 1999 trial (Sykes, 2003).

These examples illustrate a pattern of activity during the 1990s in which commercial rock lobster fishers and the leadership of the rock lobster fishing industry at the national and regional levels began to assume some management responsibilities within their fisheries and the industry as a whole. As this movement progressed during the mid and late 1990s, it led to the development of the New Zealand Rock Lobster Industry Council (NZ RLIC) and the regional CRAMACs. Legislation was passed in 1999 that allowed the government to delegate certain fisheries management responsibilities to Commercial Stakeholder Organizations (CSOs), which provided the basis for further expansion of the industry role.

4.6 Development of the New Zealand Rock Lobster Industry Council

The 1990s were a period of intense activity within the rock lobster industry. Not only did the industry enter into the QMS, it also took on an active role in participating in fisheries management. This was largely encouraged by the vision outlined by the Rock Lobster Steering Committee. With this background, during the mid 1990s, efforts began to formalise and institutionalise this industry role in management.

As regional groups took on more responsibility, they began to need more structure and thus formed or revitalized formal organizations. For example, the Southern Rock Lobster Research and Development Committee (Foggo, 1993) was formed to support research activities and the Otago Rock Lobster Liaison Committee (ORLLC, 1994) expanded its responsibilities. The need for national coordination and support of regional activities was rapidly growing beyond that which could be provided by the Fishing Industry Board (Sykes, 2003). During 1996, a series of discussion papers were developed and meetings took place in which the concept of the New Zealand Rock Lobster Industry Council (NZ RLIC) and its relationship with its associated regional groups (or CRAMACs) was hammered out (e.g. Sykes 1996a, 1996b). In June 1996, the NZ RLIC was formed with the understanding that CRAMACs would form and associate with the national organization. The NZ RLIC became one of the first examples of what are now called Commercial Stakeholder Organizations (CSOs).

A final critical development for rock lobster co-management occurred in 1997 when stock assessment research contracts became contestable (i.e. made open for bids, rather than conducted through single party contracts). The NZ RLIC approached the newly formed New Zealand Seafood Industry Council (SeaFIC) fisheries scientists as well as the traditional service provider, the National Institute of Water and Atmospheric (NIWA), about creating a joint venture for providing rock lobster stock assessment research. The consortium won a one-year contract based on the concept of industry and NIWA scientists working together, with coordination and extended voluntary access to fishing boats provided by the NZ RLIC. The consortium now regularly receives multi-year contracts and uses CRAMACs and individual harvesters as subcontractors (Sykes, 2003).

TABLE 2
2003/4 Rock Lobster Research Programme

Region	Intensive Catch Sampling	Tag & Release	Vessel Logbook Programme
CRA 1	15 days	2 500 lobster	No
CRA 2	12 days	5 000 lobster	Yes
CRA 3	28 days	None	No
CRA 4	35 days	None	No
CRA 5	None	None	Yes
CRA 6	None	None	Yes (voluntary)
CRA 7	15 days	None	None
CRA 8	None	5 000 lobster	Yes
CRA 9	None	300 lobster	Yes (voluntary)

Source: Developed from NZ RLIC (2003).

Table 2 summarizes recent research plans, for 2003/04. This table illustrates the devolved nature of this institutional arrangement as the levels and types of CRAMAC research activities vary with the CRAMACs' specific needs and institutional arrangements. Thus, in areas where the fishery was under great harvest and political pressure (such as CRA 3 or CRA 6) and where institutional arrangements were favourable, greater research activity was observed than in other regions. This pattern of varying activity levels between CRAMACs is repeated in other activities and is discussed in greater detail later in this chapter.

4.7 Development of the Seafood Industry Council and Legal Recognition of Commercial Stakeholder Organizations

While the developments in the rock lobster industry were remarkable, they were not occurring in a vacuum. Similar movements towards co-management were taking place in other fisheries. Organizations such as the Challenger Scallop and the Orange Roughy Management Company were forming and seeking to take on management responsibilities (see Mincher and Clement *et al.*, this volume). As this occurred, the needs for a national organisation also changed. The old 1950s/1960s model of the monolithic Fishing Industry Board was no longer appropriate. Instead, the New Zealand Seafood Industry Council (SeaFIC) was formed in 1997, with a model of Commercial Stakeholder Organizations (or CSOs) as the building blocks, all represented on a Board of Directors that governs overall activity. Today, SeaFIC describes its role as "to promote the healthy development of the New Zealand seafood industry. This occurs through advocacy, policy development, and the provision of scientific and educational services to the commercial seafood industry" (SeaFIC, 2003).

The 1999 *Fisheries Amendment Act* supported this movement towards CSOs and devolved governance. It allowed delegation of certain management responsibilities to "approved service delivery organizations," or CSOs. Essentially, CSOs are authorized to carry out routine management activities, including research, while the Ministry maintains the role of setting management standards, enforcement and auditing CSO activities. A change of governments, from the National Party to a series of Labour coalition governments, and other factors has slowed the efforts of many CSOs to take on full management responsibilities. But the 1999 legislation provides the legal framework for considerable devolved governance or co-management efforts within the fishing and rock lobster industries.

CRAMACs undertake activities at a variety of levels, as illustrated in Table 3. In 2003, CRAMAC activities primarily centred on scientific data collection efforts, although these groups and NZ RLIC also have a role in formal setting of TACs/TACCs (albeit in a way more closely resembling traditional consultation). However, some CRAMACs (such as CRA 2, 5, 7 and 8) were more aggressively involved in management activities beyond scientific data gathering. These groups either supported the development of NZ RLIC or were actively developing relationships with other non-commercial fishery interests. While there are no universal correlations between fishery and CRAMAC characteristics and management activities, it appears that CRAMACs with high proportions of owner-operators and the use of two-tier voting are closely associated with management efforts. Two-tier voting is a voting system where a system of one-person/one-vote is used on issues other than finance, TACC adjustments and quota management area (QMA) boundary decisions. In these decisions, voting is proportional to quota ownership (essentially, one-tonne/one-vote).

5. DEVOLVED GOVERNANCE UNDER THE NZ RLIC

5.1 Organization and Purpose of the NZ RLIC

The New Zealand Rock Lobster Industry Council (NZ RLIC) is an umbrella organization composed of nine regional organizations or CRAMACs. Geographic

TABLE 3
2003 CRAMAC Characteristics and Activities

CRAMAC	Fishery Characteristics			CRAMAC Organization		Management Efforts
	Tonnes Commercial Catch	% of Fishery Commercial	Proportion Owner-Operator (2002) ¹	Voting Rules	Meeting frequency	
1: Auckland/northland	130.5	?	Majority	Postal ballot as needed, 2 tiered	1–2 mtgs per year plus postal ballots	No self-developed activity. Cooperate with RLIC activities (catch sampling, tagging)
2: Bay of Plenty	236.1	52%	High	Ltd Liability Co. quota owner vote, proportional voting	2 a year	Most influential in development of RLIC. 1st data collection programme. 1st to employ staff
3: Gisborne/East Coast	327	72%	Low	Incorporate Society ² 2 tiered voting ³	2 a year	Developed own harvest strategy including 50% TACC reduction in 1993
4: Wellington Hawkes Bay	576	75%	Majority	Postal ballot as needed, 2 tiered	Postal ballots only	Constitution being drafted, not shareholder in RLIC Cooperates with RLIC activities (stock monitoring, sampling)
5: Canterbury/Marlborough	350	75%	High	Incorporate Society 2 tiered voting	3 a year	Research committee initiated logbook programme, tag & release, charter logbook programme. Strong relationship with recreation, employ part time coordinator
6: Chatham Islands	360	97%	Low	Incorporate Society 2 tiered voting	2 a year	Coordinated with national and MFish to create Fisherman's office Cooperative on RLIC activities
7: Otago	89	82%	High	2 tiered voting	3–4 a year	Developed regional management plan, Initiated stock monitoring, tag and release programme, part time coordinator
8: Southland	568	87%	High	Incorporate Society 2 tiered voting, usually consensus	2 a year	Hired regional coordinate and field technicians, extensive tag and release programme, #2 with logbook programme. Works with environmental and Maori interests
9: Westland/Taranaki	47	?	High	Incorporate Society 2 tiered voting	1 per year	Cooperates with RLIC activities (stock monitoring, sampling)

¹ Percentage of fleet that is quota share owner operator: Majority = >50% High = >66% Low = <50%.

² Incorporated society – memberships open to all those actively involved in business of fishing. Quota share owner, ACE owner, skipper, crew, processor/LFR.

³ While two-tiered voting is in constitution, most issues are decided based on consensus. This holds for all CRAMACs with this voting structure. Two-tiered voting means 1 man 1 vote other than on issues of finance, TACC adjustments, QMA boundary decisions, where quota decides on proportional vote.

boundaries for the CRAMACs are based on the nine regional quota management areas for the species *Jasus edwardsii*. While membership varies based on individual CRAMAC constitutions, in most CRAMACs, quota owners, permit holders, processors and exporters are all eligible for membership. Each CRAMAC appoints a representative to the board of the NZ RLIC and contributes to the national organization's operational budget in proportion to the TACC for their region. Funding is collected through a levy on all rock lobster, which is collected at the point of catch landing. The NZ RLIC has a variety of representation and technical assistance responsibilities for its CRAMACs. These include: advocacy activities, providing (or coordinating) stock assessment research, assistance in developing management plans and other duties. The NZ RLIC represents the rock lobster industry on the board of SeaFIC.

5.2 Why the RLIC and CRAMACs emerged

The emergence of devolved governance under the RLIC and the CRAMACs arose gradually, rather than being crisis driven. Examination of port events suggests that the RLIC and the CRAMACs emerged because of (a) a strong tradition in the rock lobster industry of involvement in the fishery (or the building of social capital) and (b), a growth in the property rights.

Within the rock lobster industry, there is a tradition of involvement and participation in the fishery beyond just catching the fish. A pattern of consistent but growing rock lobster fisher and fishing industry participation in governance activities is clear. This includes:

- i. Historical existence of active port associations and the Federation of Commercial Fishermen (in which rock lobster fishers were a significant proportion of members);
- ii. Consultation over the decision to introduce the controlled fishery;
- iii. The ability of the rock lobster industry to reject the QMS in the early 1980s;
- iv. The extensive national-level debate, meetings, manoeuvrings and votes surrounding the introduction of QMS in the late 1980s;
- v. The development of the NRLMG and its changing role in promoting fishers' activities;
- vi. Movement on the regional and national level towards developing regional management initiatives and scientific monitoring programmes during the 1990s; and
- vii. Development of the RLIC and the CRAMACs in the late 1990s.

This development or accumulation of expertise and experience encouraged the emergence over time of the NZRLIC and CRAMACs as institutions capable of sharing governance of the rock lobster fishery with the government. The pattern of development appears subtly different to that which Ostrom (1990) predicts. While development of institutions managing CPR are usually described as localized and then expanding in geographic scope, here the pattern shows involvement starting at the national level then slowly growing in industry's involvement in management, with growth in CRAMAC involvement matching the regional fishery needs and characteristics.

When the QMS was introduced to New Zealand's finfish fisheries in 1986, ITQs represented a simple right to extract a specified tonnage of fish. Over time, the property right that ITQs represent has changed to represent a more extensive bundle of rights.

TABLE 4
Timeline of Events Influencing ITQs as Property Rights: 1986–2000

Event	Description	Influence on Perception of Property Rights
1980–1990 Controlled Fishery	Rock Lobster as a controlled fishery	Rock lobster fishers have extremely limited property rights as number of fishers is severely limited. Rights are non-transferable.
1986 Fisheries Amendment Act	Quota Management System (QMS) introduced	ITQs defined as a perpetually held right to harvest a specific amount of fish, while government retains ownership
Ongoing – Security of ITQs as asset and as loan collateral	ITQs not well accepted as loan collateral by banks. 1996 law provided registry for liens, but loans still difficult to get.	Perception of ITQs as strong property right (or as an ownership right) is undermined by difficulty in obtaining loan financing.
1989/90 Switch from Tonnage to Proportional Allocation	Government stops entering market to change TACC. Instead, tonnage ITQ owners have rises or falls with TACC changes.	ITQ owners bear the risks and benefits of changes in TAC. Large companies and industry leaders saw these changes as improving property rights, small fishers saw as weakening rights.
1991 – Rock Lobster Enters QMS	Rock lobster enters QMS	Fishers in rock lobster fishery have same rights and incentives as other New Zealand fishers
1992 –Treaty of Waitangi Settlement	Maori granted 10% of quota; plus half of Sealord Products (NZ\$150 million); plus 20% of all new fish stocks brought into QMS.	Government's use of ITQs as partial settlement of Treaty of Waitangi claims increased perceived strength of ITQs as a property right.
1994 – Switch from resource rentals to cost recovery	Quota owners pay for part of the cost of management, rather than a "rental fee" for the privilege of fishing in New Zealand waters.	End of resource rentals symbolized a reduction of Government property rights and an increase in ITQ owner property rights. Incentive structure of cost recovery encouraged quota owners to become more actively involved in fisheries management.
1996 Fisheries Amendment Act	Primarily administrative reforms, more explicitly defined ITQs, encouraged loans on ITQs (see above)	Provided a more explicit definition of ITQs, created ACE, and encouraged loan financing (see above)
1999 Fisheries Amendment Act	Legislation allows MFish to delegate some management powers to CSOs.	Explicitly recognizes ITQ owners as having a legitimate fisheries management interest that can be exercised through stakeholder groups.

This series of changes is summarized in Table 4. Four changes are especially notable: First, the switch from tonnage to proportionality in 1990 placed the costs and benefits of stock changes on the quota owners, thus giving them an incentive to better manage the fish stocks. Second, the use of ITQs to settle the Treaty of Waitangi Maori rights issues in 1992 strengthened the perception (and political reality) of ITQs as a perpetual ownership right. Third, the switch from resource rentals to cost recovery in 1994 ended the symbolic acknowledgment of government ownership of the fisheries and the incentive structure of paying for management costs encouraged quota owners to become more active in fisheries management and cost control. Finally, the legalisation of stakeholder group management in 1999 recognized the management interests and rights of quota owners.

This strengthening of property rights coincided with events in the development of devolving rock lobster governance in a mutually supportive process in which strengthening property rights and engagement in management reinforced each other over time. The result was the still evolving approach that we see today in the RLIC and the CRAMACs.

The accomplishments of the New Zealand rock lobster industry (and the New Zealand fishing industry in general) in developing this governance approach are remarkable. However, the story is not yet finished and challenges remain. Daryl Sykes (Chief Executive of NZ RLIC) suggests that two issues warrant particular attention (Sykes, 2003):

- i. *Separation of Commercial Catching Rights from Commercial Quota Ownership Rights.* When rock lobster was first brought into QMS, most fishers held both property rights (ITQs) and caught their own fish; they were owner-operators. Today, ITQ ownership is often held by one individual (or company) while the catcher is another individual. Sykes argues that this arrangement can reduce the long-term incentives that drive many owner-operators to be proactive in fisheries management. Essentially, those fishing on quota owned by others believe that they will not receive benefits from the long-term improvements (Sykes, 2003).
- ii. *Failure to Define All Extractors' Rights.* When the whole rock-lobster fishery – commercial, recreational and customary Maori – is examined, there are differences in how well-defined property rights actually are. Commercial rights are the best defined through ITQs. However, the recreational fishers' and customary Maori fishers' rights are less well defined, even though they often take much larger proportions of the total catch. This makes it difficult for the commercial sector to justify investment in management activities such as scientific research or ITQ shelving when they believe other sectors will receive substantially more benefit while not contributing to the costs. Thus, there may be reduced incentives for continued participation if not addressed through better definition of all parties' property rights (Sykes, 2003).

6. EFFECTS OF DEVOLVED GOVERNANCE AND PROPERTY RIGHTS

Catch and catch per unit effort (CPUE) were presented in Figure 1. Since QMS and the later development of devolved governance were introduced, catch levels have been reduced through TACC reductions and CPUE has increased. Scientific stock assessments (e.g. NRLMG, 2002; NRLMG, 2001b) appear consistent in their assessment that the stocks are safely managed, subject to a degree of uncertainty surrounding recreational and illegal catch. QMS and the devolved governance are so intertwined, however, that it is difficult to separate their relative contributions.

The effect that devolved governance had on the process of management is more directly observable. There is clear evidence of increased participation of the fishing industry and individual fishers in the management process. The NZ RLIC acts as an advocate, research provider and coordinator of activities for the regional CRAMACs.

This improvement in the management process in itself has value, as research has indicated that resource user participation in rule-making and management activities increases compliance levels and thus the robustness of self-management regimes (e.g. Ostrom, 1990; Ostrom, Gardner and Walker, 1994).

At the regional level, there are also a variety of activities and activity levels. These range from varying degrees of participation in RLIC sponsored activities to initiating their own efforts, in the form of stock assessment or working with other fishery interests. There are a variety of property rights and voting arrangements at the regional level, which appear to, in part, explain this variation. Table 3 summarizes this considerable variation in activities and property rights arrangements. It shows that property rights have an effect, but it is not a simple one.

In the most active CRAMACs (2, 3, 5, 7 and 8), all except CRAMAC 3 have a high proportion of owner-operators. This supports the argument that groups where the harvesters have a more direct and powerful voice undertake more management activities. However, not all measures behave as property rights as governance literatures would suggest. Ostrom (1990) predicts greater success among smaller groups. There is no consistent pattern here: relatively small groups (measured by tonnes commercial catch, which correlates with number of quota owners) are among the less active, while CRAMACs with larger catch are among the most active. Similarly, whether the commercial sector comprises a relatively large proportion of the fishery (and thus receives more benefit from stock improvement) is not a strong predictor of activity. Some groups with a lower proportion are quite active (e.g. CRAMAC 2) while others with an almost exclusively commercial fishery are less active (e.g. CRAMAC 6). These results suggest that while the distribution of property rights clearly plays a role in the development and success of devolved governance arrangement, how this occurs and how property rights distribution interacts with social capital cannot yet be understood in this case. Both play an important role.

The development of devolved governance in the form of the NZ RLIC and the CRAMACs was a long-term (multi-decade) process that involved both the development of social capital and management experience within the industry and a quite remarkable expansion in property rights. The continuing development of this approach throughout New Zealand's fisheries suggests that the presence of property rights in addition to social capital development are key requirements for the successful development of devolved governance and self-management (Yandle 2003, 2006).

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