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**The Possibility of Evolution from Market-based Regulation
to Common Pool Regulation of a Natural Resource:**

A Case Study of New Zealand's Commercial Fisheries

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Introduction

As the world's population grows, fisheries -- particularly off-shore fisheries -- are an increasingly important food source. Yet there is also evidence that these fisheries are being exploited to the point of over-fishing and ecosystem degradation. Over the last 40 years, the global fish catch quadrupled, but the catch is now no longer rising. (Ministry of Fisheries 1996a, p.3) Since the creation of 200 mile national economic exclusion zones (EEZs), many nations have searched for ways to regulate fishing within these zones. This job of regulating has been complicated by factors such as imperfect information, high enforcement costs, and the difficulty of regulating a resource that is itself constantly moving and possibly migratory.

One regulatory response is the adoption of market-based regulatory strategies such as tradable permits or quotas. Under these strategies, regulators use economic incentives to encourage the individuals or companies to behave in a certain manner. Tradable permits refers to a process in which the desirable level of a certain activity (such as fishing) is set by a regulatory authority, permits for this level of activity are issued, then the individuals or groups involved in the activity trade the permits until the least expensive method of achieving the regulatory goal is chosen. Over the last decade, both academics and practitioners have devoted considerable efforts towards developing and implementing these strategies.

Yet these strategies receive considerable criticism such as: failing to account for the transitory nature of fish (e.g., changes in population and location); creating incentives for overcapitalization and poaching (Schlager, p. 24-25); concentrating power among a few companies (Hannesson, p. 93); and requiring large amounts of information (Pearce and Turner).

Instead alternative arrangement, such as self-organizing governance, are raised. A considerable body of research has documented many cases in which locally based collective action can be used to effectively govern and preserve natural resources, and described the conditions which best foster this type of resource management. (e.g., Ostrom, 1990, 1995) Much of this research focuses on existing self-governing organizations, and advocates the importance of preserving these organizations.

But in many situations, such as large-scale commercial fishing in industrialized nations, self-governing organizations are destroyed or never existed. Thus, with no existing organizations to preserve, if self-governing organizations are desirable, the organizations must be built. Given the current policy emphasis on market-based regulation and tradable permits, it is reasonable to ask whether a transition from tradable permitting to self-governing organizations is possible. This paper, after providing information about the theories of both market-based regulation and self-governing organizations, uses a case study of the New Zealand off-shore fisheries to explore the possibility of evolving from a market-based regulatory system to a system that is, to some degree, self-governing.

Market-Based Regulation and Tradable Permits

Market-based environmental regulation first became a topic of serious academic study when, within months of each other, the Brookings Institution in Washington DC and the Institute of Economic Affairs in London published volumes exploring the roles of pricing and the market in managing environmental pollution. Published by the Brookings Institution -- and thus better

known in the United States -- Kneese and Schultze's Pollution, Prices, and Public Policy argued that environmental policy must be effective and enforceable, flexible, and efficient in order to address the complexities of environmental problems. They advocated the use of effluent charges or pollution taxes to reach pollution reduction goals. This approach would free both business and government for regulatory burdens, encourage companies to use the most efficient methods to reduce pollution, and raise revenue for other public purposes -- such as civic environmental projects.

In Pricing for Pollution, Wilfred Beckerman explored several options for using market incentive for environmental regulations. Like Kneese and Schultze, he advocated pollution charges. But he also went further, arguing that a producer's costs should "reflect the true full social costs of his productive activities." (Beckerman, 47). Beckerman considered pollution taxes, pollution abatement subsidies, or direct community compensation set at levels equal to the social cost of pollution, but cautioned that these methods would have effects on income distribution. Instead Beckerman advocates tradable permits as "the system under which the authorities decide what they think is the desirable level of pollution . . . and then issue, on the market, 'rights' to this amount of pollution." (51) The market will then set the price of these permits at the true social cost of the pollution. Beckerman describes the advantages of such a system as: allocating costs efficiently, providing economizing incentives, allowing consistent and automatic application, and avoiding the inefficiencies of direct controls.

From this introduction, the broad concept of market-based environmental regulation and the more specific tradable permits rapidly spread through the environmental economics and environmental policy literature. Indeed, these techniques have been advocated for a variety of

purposes including: regulating non-point source agricultural pollution (Norman and Keenan), reducing energy use and carbon dioxide emissions (Birkelund, Gjelsvik, and Aaserud), encouraging sustainable development (Raufer), restricting vehicle access to central cities (Toh, Wong, and Lu), and reallocating water in the Middle East (Becker, Zeitoni, and Shechter). More recently, however, the literature has focused on more complex issues, such as the relative merits of different types of market-based environmental regulations, the effects of policy limitations on tradable permits, and the effects on complexities on efficiency and effectiveness of tradable permits. As a result of the recognition of these complexities, criticism of tradable permits has also developed.

One topic attracting attention is how marketable rights are distributed. In "Incentives for Advanced Pollution Abatement Technology at the Industrial Level: an Evaluation of Policy Alternatives," Jung, Krutilla, and Boyd found that the choice of method used to distribute tradable permits had an effect on the efficiency of the regulatory program. They concluded that distribution methods could be ranked as follows: auctioned permits, emissions taxes and subsidies, issued marketable permits, and differentiated performance standards (ranked most efficient to least efficient). These results have immediate policy implications since issued marketable permits appear to be gaining increasing favor in the realm of environmental policy and these results suggest that this popular regulatory method is not the most efficient.

Other recent studies have examined both market-based environmental regulation and tradable permits to find that when complexities are added to the basic model of tradable permits, quite large amounts of efficiency can be lost. In "Coping with Complexity in the Design of Environmental Policy," Hahn, McRae, and Milford introduced uncertainty and non-linearity into

the modeling of environmental regulation and found that policy makers and analysts need to acknowledge that most tradable permit systems involve multiple objectives, and that these complexities need to be addressed when developing policy. For example, if the costs of compliance, monitoring, and enforcement were introduced to the market, they would probably change the choice of abatement projects as higher abatement costs were moderated by lower monitoring and enforcement costs. Pearce and Turner's "Market-Based Approaches to Solid Waste Management" takes a similar approach. By using modeling to compare traditional regulation, packaging taxes, deposit-refunds, and tradable permit, they incorporate the presence of constraints or "failures" including: information failure, lack of "systems thinking," lack of economic cost-benefit thinking, and market failure into their model, and as a result reject tradable permits under these conditions. By introducing problems, such as market failure and information failure, Pearce and Turner continued the trend of acknowledging and attempting to develop techniques to account for complexities in the market-based environmental regulation.

Similar results are found in a theoretical and implementation study of non-point source agricultural nutrient pollution by Norman and Keenan. They explore several techniques of market-based environmental regulation -- including tradable permits -- focusing on implementation factors such as market inefficiencies that can reduce the effectiveness of these techniques. The authors find that inefficiencies such as significant regulatory information requirements, monitoring and enforcement difficulties, procedural issues with the tracking of permit trading, weather-sensitive pollution levels, and education needs all reduce the theoretical efficiency of tradable permits. Norman and Keenan conclude that "as permit trading shifts farther from point source based to non-point based, the associated implementation difficulties increase

considerably.” (165) They also conclude that market inefficiencies must be addressed when forming environmental policy.

Finally, Bernstein, Farrell and Winebrake explored the effects that policy restrictions may have on the sulphur dioxide allowance market instituted by the 1990 Clean Air Act. The authors modeled impact that regulatory restrictions such as requiring the use of in-state coal, restricting trading, and requiring utility plants to use scrubbers. Results show that the effects of these measures were wide-ranging -- raising the compliance costs from \$1.47 billion under a fully competitive market to \$2.15 billion under in-state coal restrictions, to \$3.83 billion under forced scrubbing. (750) While not discouraging these efforts to meet other goals (such as job preservation) through restrictions on tradable permits, the authors suggest that policy-makers must be aware of the compliance costs of restrictions on tradable permits.

These complexities are also the reason why many researchers and policy analysts are concerned about applying tradable permits (or individual tradable quotas -- ITQs) to dynamic natural resources such as fisheries. Indeed, free-market oriented institutions such as the World Bank are recognizing the limitations of ITQs. It points out that ITQs are not suitable for many situations. When effective monitoring, enforcement, and fish stock predictions cannot be made; or when national ideologies or public resistance prevent full acceptance of ITQs, this form of regulation should not be attempted. (Loayza, xvi) But criticism is also based on the essential nature of ITQs. One such critique was written by Edella Schlager in 1990 -- several years before many of the more complex studies described above were published. Pointing out the unstable nature of fish populations and their seasonal migrations, Schlager argues that these uncertainties will lead to overcapitalization, strong incentives for “quota busting” or poaching, and difficulty in

modeling appropriate quotas. Schlager also argues that:

[I]n many situations in which policies derived from the bionomic model have been applied, institutional arrangements have already existed Instead of being applied in an institutional vacuum, they have been applied in institutionally rich environments. oversimplification and the existence of prior institutional arrangements have adversely affected the efficacy of [ITQ] policies. (Schlager, 26)

It is to these existing institutional arrangements that researchers and practitioners interested in collective action say we should direct our attention.

Collective Action as an Alternative to Market-Based Regulation

If the broad field of market-based regulation can be simply described as the restructuring of economic and business incentives so that self-interest is used to reach an objective; then collective action can be described as using locally based self-governing institutions to reach an objective. But as with market-based regulation, there is considerably more to collective action than this simple definition.

Perhaps the definitive work on collective action is Elinor Ostrom's Governing the Commons. In this book, Ostrom contests the notion that privatization or government control are the "only" ways to avoid Garrett Hardin's "Tragedy of the Commons." Instead, she proposes that the individuals using the commons (or common pool resources -- CPR) can forge an agreement or code of conduct guaranteeing that all users will follow a strategy that will result in the sustainable use of the common resource through self governance.

Drawing upon many case studies of both successful and unsuccessful agreements or institutions, Ostrom defines seven criteria for successful self governance: clearly defined

boundaries; congruence between “appropriation and provision rules” and local conditions; collective-choice arrangements; monitoring; graduated sanctions; conflict-resolution mechanisms; and minimal recognition of rights to organize. In addition, for CPR management institutions that are part of a larger system, nested enterprises must also be present. Table 1 (Ostrom, 90) provides further information about these requirements, and in-depth description of these conditions can be found in both Governing the Commons and “Designing Complexity to Govern Complexity.”¹

**Table 1: Design Principles Illustrated by Long-Enduring CPR Institutions
(Ostrom, 1990)**

Design Principle	Description
Clearly Defined Boundaries	Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself.
Congruence between appropriation and provision rules and local conditions	Appropriation rules restricting time, place, technology, and/or quantities of resource units are related to local conditions and to provision rules requiring labor, materials and/or money.
Collective-choice arrangements	Most individuals affected by the operational rules can participate in modifying the operational rules.
Monitors	Monitors, who actively audit CPR conditions and appropriate behavior, are accountable to the appropriators or are the appropriators.
Graduated Sanctions	Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to the appropriators, or by both.
Conflict-resolution mechanisms	Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.
Minimal recognition of rights to organize	The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.
Nested enterprises (for CPRs that are part of larger systems)	Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

¹Given the intended audience of this paper, I am limiting my discussion of these criteria. For a more general audience, I would have provided a more detailed explanation of these criteria.

An example of the development of a new self-governing institution is also presented in the case of the groundwater withdrawn in southern California. This case is used to illustrate conditions that encourage the development of new institutions. First, the development of the institutions took place in stages with the participants able to gain some benefits before committing additional resources to the institutions. Also, "each institutional change transformed the structure of incentives within which future strategic decisions would be made" (Ostrom 137) thus encouraging further institutional development. This process had the additional benefits of increasing information availability and encouraging communication. Finally, the state government supported this process in several ways. The most direct support came from providing an arena (the courts) to enforce agreements, and by providing legal and technical assistance. But perhaps a stronger support was the state government's commitment to home rule. Because the state government had a tradition of supporting (both financially and legislatively) the rules and solutions developed by local stakeholders, the new institution has an opportunity to thrive. Ostrom concludes that:

A similar set of individuals facing similar problems in an entirely different type of political regime may not be able to supply themselves with transformed micro institutions. The difference between an active effort by a central government to regulate appropriation and provision activities and an effort to provide arenas and rules for micro institutional change is frequently blurred. (Ostrom 139)

Thus, one must be concerned not only about the local actors, conditions, and rules, but also about the role played by a central government.

In addition to these governmental or process concerns, Ostrom has identified six internal characteristics of appropriator groups that improve the likelihood of them forming a successful institution. These characteristics are: sharing the belief that they will be harmed if the change is

not adopted, being affected in similar ways by the proposed, having a low discount rate; low information, transformation, and enforcement costs; sharing reciprocity and trust; and forming a relatively small and stable group. (Ostrom, 215) While the last condition is identified as less important than the first five, these six characteristics provide the basis of a complex set of conditions necessary to successfully create an institution capable of governing a resource. Table 2 (below) provides a summary of the characteristics associated with successful long-term institutions and the development of new institutions. These characteristics can be used to examine the conditions necessary for shifting towards a regulatory model more closely identified with self-governing institutions.

Not sure what she is doing here

Table 2: Summary of Characteristics Associated with the Development of New CPR Institutions (developed from Ostrom, 1990)

Design Principles	Conditions Encouraging Institutional Development	Appropriators' Internal Characteristics
Clearly defined boundaries	Incremental institutional development	Shared belief that each is harmed if change isn't adopted
Congruence between rules and local conditions	Early benefits outweighing initial "investment"	Affected in similar ways by the proposed
Monitoring	Increased information	Low discount rate
Graduated sanctions	Increased communication	Low information, transformation, and enforcement costs
Conflict resolution mechanism	Central government support	Shared reciprocity and trust
Minimal recognition of rights to organize		A relatively small and stable group
Nested enterprises		

An essential concern of both market-based regulation and CPR is the concept of property rights. While market-based regulation tends to view property as either wholly owned by the state or a private entity, a more complex view of bundled property rights can also be applied.

(Schlager & Ostrom, 1992, 1993) Using this view, there are four different powers associated with property rights, and a person's property rights position is determined by which property rights he or she controls. (See Figure 1.) For example, in the case of fisheries (for which this model is designed) only an authorized user can only enter the fishery and harvest fish. This person may not engage in other ownership activities like keeping others from entering the fishing grounds, or deciding how the fishery will be managed. In contrast, a claimant would have the same rights as an authorized user, but would also be able to form collective choice agreements with other fishers about how fishing would take place. These claimants would not, however, have the right to remove others from the fishing grounds.

	Owner	Proprietor	Claimant	Authorized User
Access and Withdrawal	✓	✓	✓	✓
Management	✓	✓	✓	
Exclusion	✓	✓		
Alienation	✓			

Figure 1: Bundles of Rights Associated with Positions (Schlager & Ostrom, 1992, 1993)

According to Schlager and Ostrom, there are several reasons for giving fishers stronger property rights: considerable amounts of evidence document successful collective choice agreement among fishers; collective choice institutions often create operational rules more closely matched to local conditions; and collective choice arrangements internalize regulatory cost -- thus increasing cooperation and reducing inefficiencies. But a key insight about bundled property rights is that the type of property rights an individual has affect the incentives and actions of that

person. (Schlager and Ostrom, 1992, 256-7) For example, authorized users simply seek to maximize their gains under the operational rules set forth for them because they must rely on others (such as the government) to set and enforce operational rules. This may result in over fishing or overinvestment if operational rules are not skillfully developed. In contrast, proprietors who have the rights of access and withdrawal, management, and exclusion, have strong incentives to invest in fisheries because they will reap the benefits. By increasing the level of property rights, one can theoretically increase the level of responsibility appropriators take for the CPR.

The Possibility of Transition

The insights gained from this sampling of collective action literature raise questions about market-based regulation. First, collective action appears to be the only theory offering strong criticism of market-based regulation. But more importantly, collective action offers an alternative method of managing CPRs under a clearly defined set of circumstances. From this point, a natural extension of the research seems to be examining the possibility of evolving from a market-based regulatory system to a system that is, to some degree, self governing.

If one applies the bundled rights concepts, it appears that both command and control regulation and market-based regulations fall within the category of "authorized users." Yet, because the people or companies operating under market-based regulations have considerably more freedom in their actions. (For example, companies regulated under tradable air emissions permits can decide how to clean up their smoke stacks; whether to clean beyond the required standard and sell the excess rights; or whether to maintain pollution levels then buy additional

pollution rights.) Furthermore, because many of these actions require some degree of interaction with others in the regulated community (e.g., negotiating permit purchases) it would appear that those regulated under market-based regulation are closer to being part of a self-organizing collective choice arrangement than those regulated under a simple command and control system. Thus, with the extension of these interactions and encouragement to work together, these companies might be able to develop their own operational rules. This action would move them up the property rights ladder from authorized user to claimant; and would raise the possibility of future moves further up the ladder.

This possibility of moving up the ladder raises an intriguing possibility: Could market-based regulation act as a bridge from a system of resource management based on regulation to a system with expanded property rights and thus a higher degree of self regulation? The remainder of this paper uses a case study of the New Zealand off-shore fisheries to explore the possibility of evolving from a market-based regulatory system to a system that is, to some degree, self governing.

New Zealand Fisheries

New Zealand is an island nation located in the South Pacific -- between approximately 30° and 50° S, 170° E, 1,200 km (1,056 miles) west of Australia. Traditionally, New Zealand was a primarily agricultural economy, relying on lamb, beef, wool and dairy exports to fuel its economy. Their economy sustained severe damage from both the inflation shocks of the 1970s and the restrictive trade barriers created by the European Union and its predecessors. Indeed, "in the

thirty years up until 1984, New Zealand slipped from being the third most prosperous nation in the world, to twenty third.” (Clark et al, 118) In 1984, as a response to these worsening economic conditions, the government started a series of economic reforms designed to reduce the central government’s role in the economy and thus spur economic growth. The government’s program consisted of deregulation, reducing subsidies, floating the New Zealand dollar, and substantial privatization. Creation of fishing property rights administered through an ITQ system occurred in part because it was seen as being in step with the government’s economic program.

In 1978, New Zealand declared its 200 mile economic exclusion zone (EEZ), essentially making all marine resources within this zone property of New Zealand. Of the 1,000 species found within the EEZ, 100 (including orange roughy, hoki, squid, barracuda and jack mackerel) are considered commercially significant. This zone, which encompasses an area of approximately 1.2 million square nautical miles, is more than 15 times the land mass of New Zealand. (Sheerin, 140; Clark et al, 119) (See Figure 2, following page) However, much of this area is beyond the continental shelf, and is not considered very productive. 1983 marked a watershed year for New Zealand fisheries management: the inshore fisheries degenerated to the point that biological collapse was imminent; the Fisheries Act of 1983 was passed, recognizing the goals of biological stability and high economic return; and introduced a limited ITQ-based management system to deep-water trawl fishing. By 1986, amendments to the ITQ management system were passed -- more explicitly recognizing economic objectives, and phasing in an expansion of the ITQ system to become the standard tool for fisheries management. According to Ian Clark (former minister of agriculture and economics) “the objectives [of this legislation] are to allow the industry to respond in an economically efficient manner to market forces ...” (Clark et al, 128)

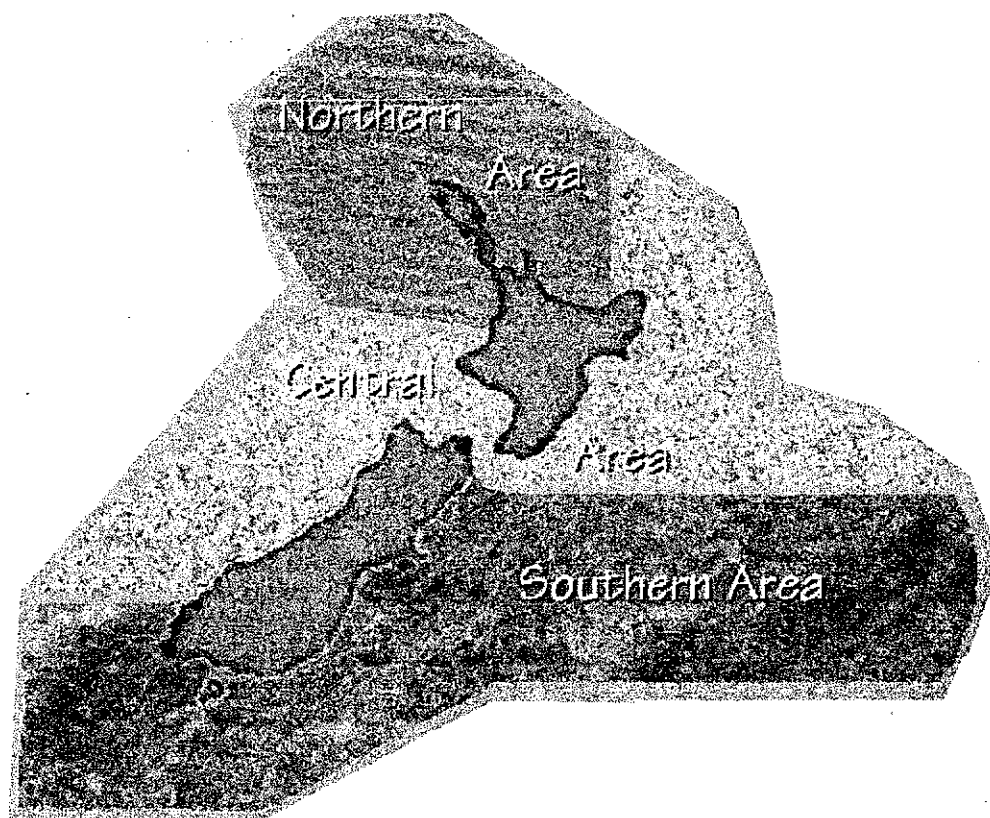


Figure 2: New Zealand ITQ Fishing Zones (Ministry of Fisheries 1996a)

The ITQ system works as follows: fishing rights were initially distributed among fishers based on their historical catches records. ITQs were initially distributed in metric tonnes (tonnes) of catch. However, in 1989 this was changed to a proportion of the total allowable catch (TAC) after difficulties appeared concerning the lowering to TAC. Additional common fishing quotas were set for small fishers with landings less than 2,000 tonnes, and to reduce industry consolidation -- no entity may control over 20% of the TAC for inshore fisheries or 35% of the deep water TAC. Also, foreign ownership of ITQs is limited to 24.9% of total catch, but foreign

operators may be used to harvest New Zealand owned ITQs. Indeed, 61% of TAC is caught by foreign vessels chartered to New Zealand owners. Trading records also show that by 1992, 80% of ITQs had been traded. While the government initially operated a formal ITQ exchange, this approach was abandoned as the number of quota holders decreased and the quota holders' requested the abandonment in favor of an informal trading system developed by the quota holders. Unfortunately, no data about the number of quota holders is readily available

Compliance with the ITQ system is maintained in two ways: some traditional "game warden" enforcement techniques are used to reduce poaching and to regulate recreational fishing; but the primary emphasis is on creating and following a paper trail documenting the catches. Four documents (Catch Effort and Landing Return, Catch Landing Return, Licensed Fish Receiver's Return, Quota Management Report) are used to create a chain of custody documenting where and by whom fish are caught, biological data necessary to monitor the health of the fishery, tax information, and information documenting the purchase of the fish after it reaches the docks. These documents are cross-checked by the government and any discrepancies are investigated as possible breaches of the fishing laws.²

Today, the New Zealand government claims that "New Zealand has been widely regarded as a world leader in effective fisheries management." (Ministry of Fisheries 1996b, p.1) Yet limitations in the ITQ system are recognized. Researchers criticize the implementation of the program (Bührs and Bartlett, 108); raise concerns about how the definition of property rights was changed (Hannesson, 93); and identify equity concerns during initial allocation, for the native Maori people, (Young and McCay, 90-92), and for inter-generational equity (Hannesson, 93).

²Information in the preceding two paragraphs is taken from Clark (1994) and Sheerin.

The government has recognized the need for improvement in the ITQ system (Ministry of Fisheries 1996b, p.2); and in response to these concerns passed the 1996 Fisheries Act.

While widely discussing the advantages of the ITQ system, the government has for a considerable period been creating the basis for further reform of the system. As early as 1991 a task force was convened to identify changes that should be made. For the purposes of this paper, the most important change recommended by the this task force was a move towards the type of property rights commonly associated with self-governing CPR management. The task force recommended that "processes should be developed to empower those holding rights in fisheries to form collective organizations ... For the commercial sector, this might mean the formation of Fisheries Quota Holder Associations." (Clark 1994, 57) This wish to encourage self-governance is also echoed in Ministry of Fisheries publications. In discussing the 1996 Fisheries Act, it is emphasized that the act "will provide further opportunities for the users of the fisheries to accept increasing responsibility for managing resources." (Ministry of Fisheries 1996b, p.2)

But widely circulated summaries and explanations of the 1996 act offer little verification of this commitment to self-governance -- at least on a scale that would immediately establish self-governing communities. (Ministry of Fisheries 1996c, 1996d, 1996e) Several incremental steps are, however, taken. Advisory committees (the National Fisheries Advisory Council and the Catch History Review Committee) have been established to provide strategic advice and decide quota allocation appeals. (Ministry of Fisheries 1996d, p.3) Property rights associated with ITQ ownership are secured. "The government will, for the first time, guarantee quota ownership as recorded in the quota register is correct. Their shares are guaranteed because the Government stands behind the quota record." (Ministry of Fisheries 1996c, p.2) This means that ITQs are now

fully recognized as properties that can be mortgaged or held as collateral -- just like any other property. Also, Maori fishing rights are now fully recognized, with 20% of the TAC now allocated to commercial Maori fishers. These ITQs, while originally based on individuals' landings will be adjudicated through Maori authority. (Ministry of Fisheries, 1996e, p.5; 1996c, p.3) Finally, the costs of monitoring, enforcement, and setting appropriate TAC levels will be recovered from the commercial fishers in the form of levies charged against their ITQs. (Ministry of Fisheries, 1996c, p.2)

While not fully embracing self-governance, the 1996 Fisheries Act does offer an opportunity to evaluate the possibility of market-based regulation providing a bridge to self-governing management of an ITQ. By comparing the criteria outlined in the third section of this paper with the realities of the current regulatory scheme in New Zealand, we can evaluate the possibility of moving from ITQs to self governance. (See Table 3, following page) Preliminary conclusions about many of these characteristics can be reached based on the research presented in this paper, however, conclusions about other characteristics would require extensive research (possibly including field work) that is beyond the scope of this study.

Before a self-governing institution is created, the conditions necessary to encourage institutional development must be present. These conditions are: incremental institutional development; early benefits outweighing initial investment; increased communication; and central government support. Incremental institutional development appears to be present -- based on the gradual creation of ITQs and the organization illustrated by the commercial fishers' ability to create an informal ITQ market. Increased communication, however, is evident in the commercial fishers' creation of an informal ITQ market. Strong central government support appears to exist

Table 3: Evaluation of the Development of Conditions Necessary for Self-Governance

Conditions Encouraging Institutional Development		Appropriators' Internal Characteristics		Design Principles	
Characteristic	Development	Characteristic	Development	Characteristic	Development
Incremental institutional development	+ There is a history of incremental development.	Shared belief that each is harmed if change isn't adopted	? Unknown	Clearly defined boundaries	+/? EEZ defined. Gvt created some local offices.
Early benefits outweighing initial "investment"	? Unknown	Affected in similar ways by the proposed	+ Guaranteed by laws and regulations.	Congruence between rules and local conditions	?/+ Gvt makes attempts, unknown how successful.
Increased information	? Unknown	Low discount rate	? Unknown	Monitoring	+ Provided by government.
Increased communication	+ Evident in development of informal ITQ market.	Low information, transformation, and enforcement costs	?/+ Unown now, government could facilitate.	Graduated sanctions	? Unknown
Central government support	+ Support evident in public statement and some actions.	Shared reciprocity and trust	? Unknown	Conflict resolution mechanism	+ Fully supported by government
		A relatively small and stable group	? Unknown	Minimal recognition of rights to organize	+ Encouraged by the government.
				Nested enterprises	? Unknown

when one examines public statements and commission findings, but the summaries of the 1996 Fisheries Act suggest a lower level of support. Nevertheless, there is government support for self-governance. Based on current research, no conclusions can be drawn about early benefits outweighing initial investment or increased information availability. These results show that three of the five conditions encouraging institutional development are favorable. Furthermore, the two unknown conditions could be encouraged through further modification of the government's policy. Thus, it is indeed possible that market based regulation can create conditions favorable to institutional development.

Much less information is available about the second set of characteristics associated with the development of self-governing institutions: sharing the belief that each will be harmed if change is not adopted; being affected in similar ways by proposed changes; having a low discount rate; having low information, transformation, and enforcement cost; sharing reciprocity and trust; and having a relatively small and stable group. From this current research, little is known about the internal characteristics of the commercial fishers. Based on the structure of the government's laws and regulations, we can conclude that the fishers are all affected in similar ways by the proposed changes. It can also be argued that, to a certain extent, the government can facilitate low information, transformation, and enforcement costs by taking partial responsibility for these costs.³ No conclusions can be drawn, however, about shared beliefs, discount rates, shared reciprocity and trust, or the size and stability of the ITQ holders. With this lack of information, it

³Whether the government would subsidize these costs is doubtful -- given the government's recent efforts to shift monitoring and enforcement costs to the ITQ holders.

would be foolish to draw many conclusions about whether ITQ holders characteristics are conducive to institutional development. But with the large number of foreign chartered vessels and the large area governed by the ITQ system, one can speculate that the development of these internal characteristics seems unlikely.

Finally, the core design principles associated with long lived self-governing institutions can be explored for indications of support for this transition. These design principles are: clearly defined boundaries; congruence between rules and local conditions; monitoring; graduated sanctions; conflict resolution mechanism; minimal recognition of the right to organize; an nested enterprises. Regarding boundaries, New Zealand has the established (and enforced) 200 mile EEZ, and the government has created three regional and eight district offices that are used to administer the ITQ program. (Ministry of Fisheries 1996a, pps 6-9) These offices could be used as the basis for clearly defined local boundaries within the country. A government-sponsored monitoring system is already in place, and the 1996 Fisheries Act created an independent system for conflict resolution that is fully supported by the government. Finally, public statement on the part of the government and the government's support for the informal ITQ market strongly indicate that government officials recognize and even support the ITQ holders' right to organize. No evidence is available, however, on congruence between rules and local conditions, graduated sanctions, or nested enterprises. But it is possible that the system of local and regional offices established by the government could be used to provide the basis for nested enterprises and col be used to link rule and local conditions. These results show that five out of the eight design principles are met or could be met under the current conditions of the ITQ system. This is a

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somewhat surprising, and positive indication, given that New Zealand is using a market-based system rather than a self-governing system. It suggests that many of the design principles associated with enduring self-governance are already in place, and that the others could be developed under the correct conditions. Thus, a review of the design principles also offer cause for cautious optimism about the possibility of moving from a market-based to a self-governing system of CPR management.

Conclusion

Overall, the results of these three comparisons provides reason to be cautiously optimistic about the possibility of evolving market-based regulation into a self-governance system. Both conditions encouraging institutional development and design principles provide some support for the theory that this transition could take place. The primary area of concern is appropriators' internal characteristics. Presently, not enough is known about these characteristics to draw an accurate conclusion. But there is reason to speculate that these characteristic will not be positive. Given the important role that appropriators' internal characteristics play, these concerns cannot be simply dismissed. Instead, these characteristics must be weighed as potential negatives -- thus forcing a pessimistic assessment of the possibility of transition. While it is definitely possible that such a transition could take place in the New Zealand fisheries, the chances of a successful outcome do not appear high -- given the amounts of unknown information. However, further research may reduce or remove these concerns.

These finding support the importance of closely examining local conditions when evaluating CPR situations. As CPR and self-governance literature becomes more widely accepted and read, there is a danger of applying it to unsuitable conditions. This preliminary case study illustrates why self-governance cannot be treated as a "one-size fits all" policy solution. Instead, policy analysts must continue to approach this tool from the bottom up -- first examining local conditions and cultures, then determining how and if self-governing solutions can be applied.

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