VALUE MAXIMISATION IN SHARED FISHERIES

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ABSTRACT

This paper explores some theoretical and practical issues in developing policy for the management of shared fisheries for maximum value. Maximisation of value from the use of resources is a key component of sustainability, and transferable rights in commercial fisheries management have contributed significantly toward this goal. Maximising value becomes more difficult in fisheries shared among commercial, amateur, and indigenous customary users, where rights of access and values gained from fishing differ in kind between these groups. Management of stock abundance and catch allocation between sectors both affect the total value achievable from a fishery. The components of value in these attributes for each sector and the basis for optimisation discussed. However, the practical aspects of optimisation across sectors pose some difficulties. Two approaches to the problem are discussed: the information approach and the market approach. It seems both face considerable challenges. Information is expensive to collect and methods that will provide reasonable accuracy seem difficult to identify in the New Zealand context. Market approaches appear promising but face problems of political and stakeholder acceptance. Conclusions on a practical way forward include the need for transparent, collaborative multi-stakeholder approaches among sector representatives and government agencies.

Keywords: policy, allocation, value maximisation, amateur, recreational

INTRODUCTION

Maximisation of value from the use of resources is a key component of the general notion of sustainability. If resources are not used efficiently there will either be less available for current use, or resources will become depleted and unavailable to future generations. Therefore maximising value from the sustainable use of fisheries resources and the aquatic environment should be a key goal for fisheries management.

Systems of transferable quota rights in commercial fisheries have made a considerable contribution to this goal through promoting the flow of resources to their highest valued use in that sector. The economic success of the fishing industry in New Zealand over the last two decades, for example, provides clear evidence of the value enabled by quota systems. However, beyond some rationalisation of fleet capacity and optimisation of individual fishing operations in the pursuit of greater value from a limited quantity of catch, there still lies a challenge to maximise commercial economic yield through higher levels of coordination among stakeholders.

Maximisation of total value from fisheries becomes more difficult still when non-commercial users and their values are taken into the accounting framework. In many jurisdictions the decisions that affect the distribution of value across the fisheries sectors are made by governments, either by departmental officials or by Ministers in Government. Often, little in the way of quantified value information is available to inform these decisions, particularly on non-commercial values. Financial information on the commercial fishing industry tends to be expressed in gross revenues, with little assessment of costs and net surplus value to the economy.

But lack of information is only part of the problem. Where net values are high, such as where quota management has been introduced, lack of policy and process change to deal with value distribution can lead to significant dispute over appropriate management settings. Where such dispute and possibly litigation becomes normalised, the whole management system can suffer from reduced credibility.

This paper sets out the general challenge of the pursuit of increased value in fisheries management, both in commercial only, and in fisheries shared with amateur and indigenous fishers. Two key factors in value management – fish stock size and tonnage allocations – are identified and their impacts discussed. Then two approaches to the inter-sector optimisation problem are introduced – the information approach and the market approach. The requirements of these are briefly discussed. The concluding section of the paper explores the potential for an approach that draws on both the information and market models that may assist to reduce both costs and conflict over outcomes. Examples from the New Zealand management system are used throughout the paper.

MANAGEMENT OF FISHERIES FOR VALUE

The foundations of the bio-economic analysis of fisheries assume that exploitation has commercial goals – that is, maximum of economic yield (MEY – defined as revenue minus costs to the industry) is the goal. Scott Gordon (1954) showed that, in the static analysis, MEY will be found at some biomass above that which produces the maximum sustainable yield (MSY) for a given fish stock. This is at the point where the slope of the sustainable yield curve is the same as that of the cost curve (figure 1).

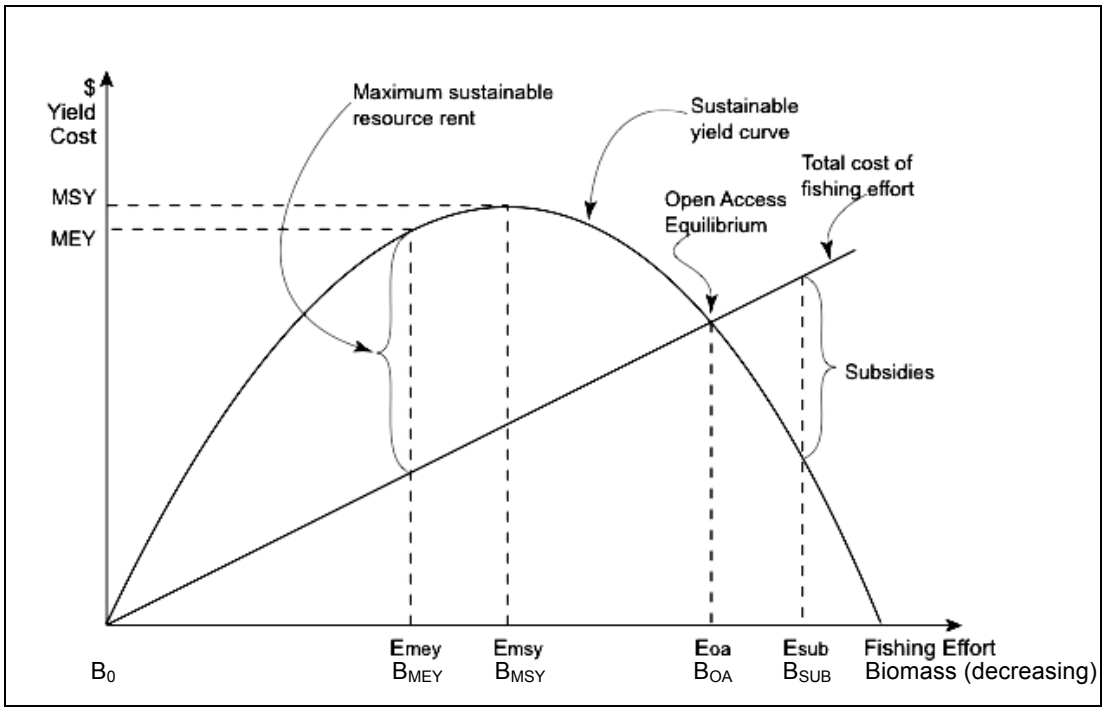

Figure 1: How value from a fish stock varies with biomass.

The specific biomass at which this occurs in relation to the biomass at which MSY is achieved (B_{MSY}), depends on the costs of effort relative to the price of fish. If costs are relatively low and prices high then B_{MEY} will be closer to B_{MSY} than for a fishery where costs are high relative to prices. It is also well to remember that B_{MSY} itself is generally less than 50% of the unexploited biomass, and can be less than 20% for some species according to some model estimates.

The most important general result of Gordon's analysis of course was to show that unconstrained entry to a fishery will continue until total costs equal total revenues (net value zero). At this point many fisheries will be at biomass levels below B_{MSY} and in some cases stocks may collapse while fishing effort is still increasing. This analysis encapsulates the key justifications for management intervention in fisheries – biological threat and economic waste.

Later dynamic analysis indicated that it could be rational for a sole owner of a fish stock to deplete the stock below B_{MSY}, and possibly further to commercial extinction, where the growth rate of the biomass is lower than the discount rate (Clark 1973). However, if the management objectives for a stock include both maximising sustainable economic yield and ensuring biological sustainability for the stock, then B_{MSY} must serve as the prima facie bottom line for stock biomass.

In the New Zealand commercial fishery, intervention has introduced individual transferable quota, which firstly defines those with and without rights to participate. Secondly, the right is quantified as a share of the available total allowable commercial catch (TACC: In New Zealand the TACC is a subset of the total allowable catch or TAC that, in addition, provides allowances for non-commercial catches and other forms of fishing related mortality). This cap on commercial extractions and accountability for individual limits on catch provides the ability to protect the resource from over-exploitation and generates some rents. The transferability of quota between firms allows the use of the resource to move to those who value it most highly – that is, the most efficient producers. This enables costs to be reduced and further rents in the fishery to be realised.

Managing for MEY is, however, not likely to be straightforward. The level of B_{MEY} depends in part on the cost structure of the industry, and this is itself dynamic. Few fisheries are truly single species target fisheries, and therefore catching costs attributed to particular species for different operators will vary with catch mixes, fishing strategies, and scale of operations. So, reaching consensus on the actual biomass to serve as the B_{MEY} stock management target, and therefore as the basis for setting TACs, is bound to be difficult.

The alternative would be to set TACs to achieve B_{MSY} (environmental bottom line) and let the stakeholders sort out a means of maximising value if they can. The achievement of B_{MEY} by this route requires excellent fisher/quota owner coordination, the zenith of which would be sole ownership (i.e. all quota shares in a fish stock held by one individual or company). As a minimum, some sort of quota owner cooperation is required, with a commitment to rationalisation of harvesting and maximisation of returns from the stock overall. Such organisations would then be able to use cost scenarios they have the ability to actually implement, to model MEY and optimise their harvest strategy to maximise profits, effectively shelving (not fishing) the balance of the quota.

In New Zealand some 30 commercial stakeholder organisations have formed to represent quota owners in particular stocks. However, coordination adequate to the challenge of managing for MEY at a biomass higher than B_{MSY} is by no means universally in evidence. Most fishers and firms, it seems, are too fond of their independence to want to sign up to a true corporate model of fishery ownership. There may be concern that potential for further rationalisation of catching capacity by such an entity would dispense with the current active role of many fishers, reducing them to passive shareholders in a fishing corporation.

Some movement towards coordination at the sole ownership end of the spectrum is apparent in New Zealand deepwater fisheries with small numbers of quota owners and high capital costs (orange roughy), where coordination is less costly and potential savings to individual firms are substantial (Clement 2000). It is likely that sustained high fuel prices will promote such rationalisation in more fisheries through their

CSOs. But under ITQs without such coordinating entities and conditions providing strong incentives to cooperate, fishers tend to optimise their operations privately – by balancing their catching rights and fishing capacity as closely as possible. This generally means that all rights on offer are fished, and that fisheries run close to the TAC, which is set with the objective of bringing the stock to B_{MSY}.

Stock Management in Shared Fisheries

In *shared fisheries* – where commercial, amateur, and customary fishers are all utilising the same stock – things can get more complicated. Although rights to take fish may differ among the sectors, the value gained by non-commercial fishers is generally also affected by stock size. Just as commercial fishers have differing cost structures and market opportunities, amateur and customary fishers have differing needs and values than do commercial fishers. Some are unrelated to stock size but, in general, larger stock sizes tend to favour the values held by non-commercial fishers.

Larger stock size firstly implies that fish will be more abundant. This may not hold at a local level: just because there are more fish in a biological stock spread across a large region doesn't mean that there will necessarily be more fish (or any) in a particular location. However, it will hold on average over the stock area and is likely to be significant to catch rates and total catches across the fishery. In general, more fish in the water should increase catch rates.

Second, an increase in stock size implies the average age and size of fish will increase, and the average size of fish caught is also likely to increase. When stocks are fished down, the age structure of the populations change. A useful way to think about this is that the longer a fish survives, the more times it is exposed to the risk of being caught. To the extent that surviving fish remain part of the target population, older (larger) fish will tend to be eliminated over time. This is important to the growth response of the stock biomass. As the average age of the population is reduced, the biomass growth rate is increased – young fish grow faster than old fish.

In some fisheries, non-commercial fishers may have the highest value for fish that are less than the maximum size available. But in general, non-commercial fishers' value for fish caught increases more than arithmetically with fish size. That is, one big one is generally more valued than two smaller fish adding up to the same total weight.

Similarly, most non-commercial fishers value abundance through being able to catch a fish more easily, and through being able to catch more fish in their available fishing time, and this value may well also increase more rapidly than apparent abundance.

It is now apparent that there can be a fundamental conflict in managing shared fisheries for value. Given a typical B_{MSY} level of 30% of un-fished biomass, the commercial preference for maximum sustainable yield is in conflict with a non-commercial preference for higher abundance and larger fish size. This conflict will be reduced somewhat in fisheries were there is very high non-commercial demand, because that sector is then required to make a trade-off between the level of sustainable catch and abundance. The conflict then becomes more of a direct one over allocations from the TAC to each sector. How to determine the optimal stock size remains an interesting and non-trivial question, which interacts with the allocation problem.

Sector Allocations in Shared Fisheries

A second key variable in optimising value across sectors in shared fisheries is allocation of the available catch. In New Zealand we have ITQ in the commercial sector, quantitatively uncapped catch rights for

Maori customary fishers, and regulatory controls – mainly daily bag limits – in the amateur sector. The arrangement for the amateur sector is founded in historical open access, modified by the notion that some limit on daily individual catches is desirable to firstly, differentiate amateur fishing from illegal fishing for profit, and secondly, constrain total amateur fishing effort where stocks are under pressure.

Decisions on allocations (as well as TACs and bag limits) are made by the Minister of Fisheries and can be contentious. The approach applied to allocation is to estimate how much the non-commercial sector is likely to catch under the prevailing conditions of stock condition and daily bag limits, and allocate the rest of the TAC to the commercial sector (an allowance for other fishing related mortality is also made – mostly to cover estimated unreported catch). This is not a directive policy so much as a product of statutory construction based on historical conditions.

Underlying the judgements about the balance between catch constraints and sector allocations is the principle adopted for allocation of commercial quota on the introduction of stocks to the QMS – catch history. This asserts that those that have invested in fishing and established a catch history should get an allocation that reflects that commitment, at least in terms of relative share of the catch if not as a tonnage. This principle has worked in the commercial sector where initial allocations can be changed through trading so that an efficient distribution is achieved within the sector. However, it does not work to maximise value with allocations between sectors because no adjustments can be made except by the Minister's decision.

It should be noted that just because tensions that may exist between historical fairness and current value cannot be eased by trading across sectors after allocations are made, is not to say that value is not taken into account in the allocation decision. The key reason that elected representatives, such as the Minister of Fisheries, are charged with such potentially controversial decisions is because they are accountable for considering and balancing the values of the electorate. Recent court findings have confirmed the obligation of the Minister to consider a range of values that together add up to well-being. However, the greater the values held by stakeholders the more pressure is brought to bear on the decision-maker. With the efficiencies in ITQ systems producing high quota values, and high cultural values for non-commercial fishing, a new approach may be warranted.

MOVING FORWARD ON MANAGING FOR VALUE

The challenge of the inter-sector optimisation problem is to equalise the marginal values for change to both stock size and allocations simultaneously. Under the current decision-making system in New Zealand, an incremental approach to the problem would be to quantitatively assess and/or model the values at stake to inform decisions on TACs and allocation between sectors. An alternative approach would be to create a common currency representing the values at stake for the sectors and allow a market to develop, so that exchange can be negotiated between the parties holding the values. Each of these approaches has its challenges in both policy acceptance and implementation.

Information Approach

The first of the above alternatives – the information approach – could, as a sole strategy, be very expensive. Even without the stock size-abundance issue, the allocation problem is very information demanding. Schedules of marginal net economic benefit (MNEB) would need to be estimated for each sector. For the commercial sector net economic benefit comprises producer surplus plus consumer surplus. The MNEB we are interested in is the amount that this benefit changes as a result of a change in fish characteristics and availability to each sector, through changes to allocation and/or stock size. As

these characteristics change the MNEB also changes. This is why we need a schedule and not just a single value for MNEB.

For commercial fisheries under ITQ, quota value (if known) could be used to infer producer surplus, with appropriate testing of the assumptions that this would involve. Further data collection through the supply chain would be necessary for this, and data on sales volumes and prices would be used to construct the MNEB schedule. To estimate amateur NEB, surveys of fishers would be required to establish willingness to pay (WTP) for changes in allocation and stock size.

A recent investigation of theory and existing methods for such valuation studies estimated that a study to produce results robust to legal test for six stocks (species area combinations) in New Zealand could take five years to complete at a cost of two to three million dollars (Bell et al. 2007). This study included a review of research work carried out in Australia that has investigated and developed methodologies over the past decade or so (see McLeod and Nichols 2004; Lindner et al. 2006). Despite the significant amount of investment to investigate this approach, it has yet to be implemented in the practical management of fisheries.

The Bell et al. study also noted key issues with estimating WTP for the amateur sector including the lack of any prices (e.g. fees for amateur marine fishing licences), and limited scientific knowledge of stock status and catches. In New Zealand a cost recovery scheme is applied to commercial fisheries to pay for a significant proportion of the costs of stock research. Driven by this system, the high value of the large volume deepwater fisheries means they attract much of the research budget and capacity. Inshore shared fisheries do not generally attract research interest unless they are of high commercial value, which means, for many, relatively little is known.

Catch reporting is required of all commercial fishing, and is a critical feature of the quota management system. Catches from Maori customary fishing, which is carried out under its own set of regulations and licensing, is also required to be reported, although this is taking some time to establish as a reliable track of catch in the sector. However, estimates of amateur catches must be made from various types of survey. Despite considerable expenditure over fifteen years, definitive estimates of amateur catch are not available for most stocks. Methods combining aerial and boat ramp surveys have recently produced good results for one or two of the most popular stocks (Hartill et al. 2006), but for most others very little is really known. Fundamental issues such as the participation rate of the general population in amateur fishing still remain unresolved.

These are basic challenges for the information approach. The estimation of MNEB curves for the amateur sector will require the participation rate and total catch to be estimated with a reasonable degree of confidence first. Tackled together, with a long-term systematic programme and sufficient funding there is reason to believe this is achievable. For New Zealand, budget expenditure in the region of $2.5 to $3 million per annum over a decade could allow catch and value research to develop to provide sufficient information to manage the key shared fisheries for value. This is only 10-15% of total current fisheries research expenditure, but would represent a significant new commitment to information on non-commercial fishing, which, under current arrangements, would need to be funded by Government.

However, having the information required does not solve the problem on its own. The view that Government could just impose a new allocation on participation in a fishery at will is both economically and politically problematic. The value maximisation objective would only be undermined by a policy that reallocated investment goods such as ITQ without redress at market value. There is little point in aiming to maximise value through allocation of resources to their highest valued use if the right to continue to benefit from utilisation of the resource is not secure.

This potential impact on the value of quota will drive resistance to (or support for) any attempt to implement the results of valuation exercises. Non-market valuation methodology is not universally understood or accepted as producing indisputable results, regardless of the rigour with which it might be applied. Those with significant economic interests at stake can be expected to attempt to undermine unfavourable results by attacking the credibility of research and analysis, as well as applying their standard messages in lobbying decision makers.

This leads us to a need to consider the possibility of redress for adjustments to both catch allocations and to the value distribution affected by stock size management. One obvious way to tackle transfers from a commercial sector under quota to amateur fishing would be for the government, or the amateur sector itself, to buy quota in the market. If the government proposed to purchase quota for the "fishing public," this raises the question of whether that is the most equitable and politically sustainable solution.

Market Approach

A direct negotiation or market approach to value management is based on the reasoning that it is effectively impossible for a governance body to comprehend the values held by a multiplicity of users, even generalised as just commercial and non-commercial fishers. The consideration of such an approach is also more or less obligatory in the face of the problems with adjustments under the information approach. A more cost effective approach to optimality would be to allow the holders of those values to compare them in a market – or at least in discussion. This works well in the commercial ITQ fisheries in New Zealand, so why not extend the rights system to amateur users?

As usual, things are not quite so simple in application as we might hope. Many of the same problems that make the gathering of information on amateur catch and value difficult and expensive might come into play here as well. The open access nature of the amateur fishery means that there are an uncertain and variable number of participants pursuing a range of different values. Some of these users will hold significant marginal values for the factors that can be affected by management settings (TACs and allocations), but others will not. For example, those fishing in pursuit of food for the family table will be affected differently from those fishing more for sport or trophy fish.

Just as the values for abundance and fish size affected by stock size management can be distinguished in kind from those associated with the total amount of fish taken, so can these other values. It is at least possible that not all non-commercial values for fishing can be denominated in kilograms of fish caught. Thus if a market were established to trade values between the sectors using quota as a currency, this will only ever deal with part of the problem. However, simplicity does reduce transactions costs and it is doubtful whether a currency for the value trade-off in stock size management (for example) could be developed. So a market system would likely be limited to allocation of the TAC, and this option is generally simplified as an extension of an existing commercial quota system to cover non-commercial fishing.

An immediate issue is raised for a market system based on individual holdings by amateur fishers – transactions costs. Earlier we saw that even in commercial fisheries where all participants are known and have their interests in the fishery quantified in quota shares, gaining agreement on specific arrangements to try to maximise value overall can be difficult. This coordination problem takes on a new meaning in the non-commercial sphere where interests are much more dispersed.

For example, if non-commercial values are spread across one million participants who hold an average net value of $200 per year for fishery access, this would place the economic value of the sector on the same page as the commercial industry in New Zealand. From national surveys of amateur fishers, the evidence is that somewhere in the vicinity of 70% of fish is caught by 30% of fishers. So a majority of

amateur fishers will have a lower than average net value for fishing. Once we get down below say $100 per person per annum, it would not take much in the way of transactions costs placed on the individual to erode this value, although cumulatively these values are large. This means that individual quota systems for amateurs, for example, could be value destroying rather than value enhancing, if care is not taken in the way they are designed.

As an alternative, a group approach to transferable quantified rights could invest the non-commercial catching rights to stocks in entities that could be either representative organisations or commercial companies. Basic allocations could be received annually by such entities that would have responsibility for ensuring that these were not exceeded. Groups holding rights could, for example, manage access, require reporting or run surveys to estimate catch, and raise funding from users to pay for these services. Such organisations could be authorised to negotiate or trade with commercial stakeholder organisations, increasing or reducing their holdings in response to demand from non-commercial fishers.

The constitutional nature of organisations holding amateur rights is a question that would require some attention. Sutinen and Johnson (2003) propose angling management organisations with functions along the lines described above, structured as listed companies. Normal commercial incentives would drive these organisations to maximise shareholder value, but this would depend upon continuing to receive an annual allocation of rights from the government. Thus the government would retain the power to ensure compliance of the organisations with a framework of rules, which would need to take into account issues of monopoly control over rights, including pricing.

Another alternative is to endow amateur fisher representative organisations with the catching rights. Questions of who is being represented and the constitutional structure of the organisation would need to be explored. However, as long as the organisation does not have the right to exclude anyone who wishes to join, and standard democratic processes prevail, this should provide a reasonable basis to proceed. This type of arrangement may well leave a residual representative role for government. In the long tail of the distribution of value held for amateur participation in fishing, there are a large number of people with a very low individual interest. Together, these values can be substantial, but the individuals do not have sufficient motivation to act to defend those values if they are threatened. Thus governments may need to continue to represent some fraction of the public interest in fishing.

From a pragmatic point of view in the New Zealand context, this scenario can seem a little far-fetched. Any practical market scheme must be based on a closed set of rights for the amateur sector. Even in commercial fisheries where the economic benefits of enclosure of the commons have been evident for many years in examples such as the New Zealand QMS, there has not been a rapid take up around the world. Conversion from open access is resisted more often than not. However, licensing schemes have been successfully introduced recently for marine recreational fishing in Australia, and most US coastal states have licensing.

In New Zealand, amateur fishers have fought hard against any form of licensing for marine fishing and so far have succeeded. The suggestion to include the amateur sector in the QMS has been around for almost as long as the system itself (Pearse 1991). However, even the most ardent and effective members of the resistance recognise that there are real issues of scarcity that must be dealt with, and that change is inevitable and could even be beneficial. On the other hand, they have a strong political hand with something like 25% of the general population claimed as amateur fishers. They are unlikely to agree to significant change unless it can be demonstrated that the new arrangements will safeguard the value that they currently obtain from the fishery, into the future. However, the costs of information gathering under current institutional arrangements suggests that some change will be required before these values can even be assessed.

ENABLING VALUE-BASED MANAGEMENT

The problems of allocation of value between commercial and non-commercial sectors are clearly linked to broader issues of governance for fisheries. A model that is focused primarily on information and the modelling of optimality assumes an ability to impose such a solution on stakeholders. Where the outcomes can have significant impacts on the value of assets such as ITQ, such solutions can be expected to put to every test available to the affected parties unless they have been involved in the development of, and support, the prescription.

Similar processes in stock assessment for setting catch limits to protect stocks result in regular challenge and review of decisions in New Zealand. This can undermine the integrity of the information gathering process, and drive up the costs of providing information and decision advice, in an attempt to ensure they are robust enough to survive challenge. Programmes to provide value information for stock management and allocation decisions based on this model without accompanying process change would be expensive and may be of questionable value in terms of overall welfare improvement.

Even if both stock assessment and value information were robust against all challenge, using that information to maximise value across the sectors implies significant change to basic rights of access to the fishery for amateur fishers. It is likely that, at least for some fisheries, tighter constraints on total take by amateurs will be required. In others, commercial allocations might be reduced to rebuild abundance to increase value to amateurs. However, to prevent this value being dissipated by a matching increase in amateur catch, further rules will be required.

The conclusion is soon reached that, if change to access rights is required to implement value management once we have the required information, those changes should logically be developed as early as possible. First, changes in access rights are likely to significantly affect the values held for fishing, and second, the required changes would be likely to lower the costs of information gathering considerably. For example, if the changes required some amateur fishers to register or be licensed, this would assist with estimating participation rates, and could provide a database for sampling of catches.

In addition, the issue already raised in respect of uncompensated changes to the distribution of rights such as ITQ would need to be addressed under the information approach, in order not to undermine the efficiency objective that is behind management for value. After the long and expensive road of information gathering and institutional change required for this approach to work, we arrive at the need for a market transaction to exchange rights between the sectors.

A market approach, as discussed above, would also require changes to existing amateur rights in New Zealand, and, potentially, significant changes in the degree of organisation in the amateur sector. However, the model would tend to drive such organisational change once in place. Potential revenue from licensing or other means of allocating the available catch within the sector could make representative organisations financially viable, where at present they struggle to survive. The commercially driven shareholders company model could achieve the same ends, and has some advantages in terms of accountability and in being able to use existing company law. It is likely that these companies holding and managing amateur fishing rights would become the new representative bodies for amateur fishing interests in any case.

Such schemes for trading catch rights would, as already mentioned, nominally only cover the value to be gained from allocation of a fixed TAC between the sectors. Other potential value, such as might be gained from managing a stock at a level greater than B_{MSY}, could be dealt with through a negotiation process. Well resourced representative or commercial operators of the amateur franchise could undertake valuation studies on other attributes of the fishing experience in order to inform their business. By

enhancing the fishing experience they would be able to increase their customer base, charging rates, and income. If they identified a potential increase in value for say a higher abundance, an agreement could be negotiated with industry organisations for a change in management target in exchange for payment or a concession in another stock.

A possible third way forward would be to distinguish interests in the amateur sector on the basis of the 70-30 rule mentioned earlier (30% of fishers catching 70% of fish). Under this scheme, the sector would be split into high and low users on the basis of a bag limit. For example, in a fishery where the current daily bag limit is 10, this would be lowered to say 3 and access would remain unrestricted for those satisfied by that limit. Those fishers who wish to be able to catch more fish than the new low limit would be required to belong to an organisation similar to the model discussed for under the market approach.

Under this model, the majority of amateurs who enjoy access but are not taking large amounts of fish would not be affected by the change. The more serious sports and food gathering fishers have a higher level of personal interest and will be more willing to pay for access and motivated to contribute to management organisations. However, this model would potentially increase the necessary charges for access rights for the high use fishers, and generate less complete information on amateur demand, activity and catch.

CONCLUDING COMMENT

To make such changes to basic access rights as moving from an open access amateur right to licensing with hard catch limits, either strong executive powers of Government or a broad consensus on this direction would be required. Neither of these pertains in New Zealand at present. Under the mixed member proportional electoral system that was introduced for parliamentary elections in 1993, New Zealand has since been governed by minority led coalitions that often need to negotiate support for legislation with opposition parties. Achieving policy and legislative change is now much more dependent on consensus among legislators, and hence among a range of stakeholders, than it was in the past.

In fisheries, where the commercial and amateur sectors are both of significant importance economically, both sides need to be supportive of any significant change. It is unlikely that such agreement will be forthcoming from the current circumstances. Such bold moves will require consensus at the level of national leadership among the fishing sectors, the Government and its agencies. Until these parties begin a positive process of collaborative discussion it is likely that major improvements in management of shared fisheries for value will remain difficult to achieve.

In order to change the current environment toward a more collaborative mode, the government may need to move into a new role. For the past decade or more, stakeholder groups have only rarely worked together on management problems. This has yielded some small successes, particularly in the scallop and rock-lobster fisheries. However, at a national level dealing with fundamental institutional change, little collaboration has been attempted. Obviously the management agency is a key stakeholder at this level, as is the Minister. Leadership from the government side in bringing all parties to the same table in a long-term process to work toward institutional change is likely to pay dividends.

Concentrating effort and resources on cultivating a new governance culture of thoughtful collaboration, mutual respect and eventually of trust, is possibly the most efficient route available to move toward maximising value from the use of fisheries resources. Without considerable work on shared ownership of the problem, commitment to common goals, and respect for the values of others, it is unlikely that stakeholders in our shared fisheries will come to feel safe enough to agree to significant institutional change in the foreseeable future.

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