INTEGRATED FISHERIES MANAGEMENT: IMPLEMENTATION AND ALLOCATION OF RIGHTS

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ABSTRACT

Managed fisheries are frequently structured on a sector by sector basis with each sector defined by the type of user or use, for example commercial, recreational and indigenous sectors. Management arrangements for a sector, however, may not be formally integrated with those for other sectors. Consequent competition between sectors for access to fish resources may undermine incentives for responsible fishing (such as rights based measures) and impair desirable co-operation between sectors on management issues. An integrated management regime including specific mechanisms providing for transfers between sectors should generate greater benefits for the broader community.

Issues raised by allocation and integration are reviewed in relation to implementation of Western Australian government under its ‘Integrated Fisheries Management’ policy announced in 2004. These issues are considered in relation to the Western Australian Rock Lobster. This fishery is mature, relatively well known and sustainably managed; nevertheless implementation of the policy raises difficult questions as to the information base required and long term mechanisms that will ensure optimal benefit. The decisions made and the processes adopted to effectively address these issues are discussed.

Keywords: fisheries management, integrated management regimes

INTRODUCTION/INTEGRATED MANAGEMENT

Integrated Management

Integration of all uses of marine resources into a consistent management framework is a frequently cited goal of marine resource management (see: Oceans Act 1996 Canada Preamble). Two different forms of ‘integrated management’ are possible; first integration of management of different types of direct consumptive use (also referred to as sectors), and secondly integration of those varied uses with broader ecological concerns for example consideration of issues of environmental impact as well as the management of coastal zones. Although acknowledging the increasing importance of placing fisheries management in a broader ecosystem context (UNESCO, 2001) this paper is principally concerned with application of the ‘core’ role for most governmental agencies relating to fisheries resources which is typically management of consumptive uses of living marine resources.

Conflict and effect on fishing and incentives

Conflict can be anticipated in a fully exploited fishery with different users, with pressures to re-allocate the resource to one sector or another. Even if initial allocations represent an optimal use of the resource at the time of allocation, over time a fixed allocation to each sector is likely to vary from optimal. Where rights to a specified proportion of the resource have not been explicitly allocated each sector has an incentive to invest in political and legal activity to gain a higher level of access. In the absence of specific re-allocation mechanisms increased fishing pressure and political action are typically the only two options available to a sector to capture a higher proportion of the resource.

In a fully utilized fishery any gain by one sector should lead to immediate reduction in the catch of other sectors if sustainability criteria are to be met. Regulatory failure can (and does) occur where increased
catch in one sector is not matched by reduction in other sectors. In theory explicit allocation of catch shares within a total allowable catch will avoid regulatory failure of this kind. This does not of itself resolve pressures to achieve re-allocations, and unless there is an explicit mechanism to do so pressures will build over time to vary allocations.

**Western Australian Context**

Western Australian State fisheries are managed through a combination of fisheries management techniques including; quotas, effort controls, size limits, catch limits and area closures as well as provisions for special access for indigenous fishers. The State of Western Australian has a long history of fisheries management controls (IFAAC, 2005) including the:

- licensing of commercial fishing in 1899;
- introduction of limited entry to commercial fisheries in the 1960s;
- freeze on the issue of commercial licences in 1983;
- development of a Fisheries Adjustment Scheme in 1986;
- development of a formal recreational fishing policy in 1990; and

**Inquiry into IFM**

In November 2002 the Western Australian Government received a report into integrated fisheries management prepared by an independent inquiry headed by the Honourable Mr John Toohey formerly a Justice of Australia’s High Court (Integrated Fisheries Management Review Committee, 2002 - ‘the Toohey Report’). The inquiry identified a range of issues that made the integration of fisheries management desirable. The Toohey Report noted with a growing population (1.5% per year compounded) and increasing coastal development competition for limited fishery resources was intensifying and resultant conflicts could impinge on effective management. The Toohey Report also observed:

> “Increasing resistance by both commercial and recreational sectors to accept changes to sectoral management without strong supporting scientific data on the relative catch shares and the impact of management on these catch shares”

and further that each sector sees;

> “reduction in their catch being taken up by competing user groups with no net benefits accruing to the stocks”

The Toohey Report also noted the need to account for indigenous use of fish resources within a management framework.

The Western Australian Government responded to the enquiry through the adoption of a formal policy on integrated fisheries management (‘IFM’) in 2004 (repeated in IFAAC, 2005, Appendix A). Although the government did not adopt all the recommendations of the Toohey Report the substance of the recommendations were adopted and specific financial and staffing resources were allocated to implement the policy.
THE ALLOCATION PROCESS - IFAAC

“I have great sympathy for the allocation committee that is responsible for coming up with a mechanism to accommodate the competing interests” the Honourable Bruce Donaldson MLC in Western Australian Legislative Council Debates (Hansard, 2004).

Structure and responsibilities

The policy adopted by the Western Australian State Government in relation to IFM (IFAC, 2005, Appendix A) gives the Executive Director of Fisheries principal responsibility for setting overall catch limits for fish resources and for complying with the objects of the Fish Resources Management Act. As noted above the objectives of that Act include specific sustainability criterion. The sustainable harvest level set would then be shared on a proportional basis. Sectors would be expected to be managed within their share and take responsibility for management within the limits set in accordance with co-operative and advisory arrangements in place.

The proportional catch shares would initially be set by the Minister for Fisheries on advice of an Independent Fisheries Allocation Advisory Committee (‘the IFAAC’). The IFAAC was given responsibility for running a set of consultative processes leading to a final recommendation to the Minister for Fisheries. The starting point for consideration of allocations would be catch shares assessed for the years 1997-2001. Future changes in these allocations would preferably occur through market based mechanisms. This paper concentrates on the first fishery identified for action, the Western Rock Lobster (Panulirus cygnus) Fishery.

Diagram:

- **Fish stock to remain**
- **Sustainable Harvest Level**
- **Recreational fishers**
- **Commercial fishers**
- **Indigenous/Customary fishers**

**Department of Fisheries**: Assesses resource, sets Sustainable Harvest Level and monitors resource shares.

**IFAAC**: recommends to Minister resource shares within Sustainable Harvest Levels.
Non-consumptive Uses/No Take Marine Reserves

Prior to consideration of specific issues relating to the Western Rock Lobster Fishery, some issues of a general nature were raised in preliminary consultations held by the IFAAC. One of the first issues of a general policy nature put to the IFAAC was to consider non-consumptive uses. The position here was put by the Conservation Council of Western Australia (referred to in IFAAC, 2005, p10) in relation to the allocation process that an explicit allocation within the total allowable catch should be set aside for non-consumptive issue. This argument was paraphrased in the Toohey Report as being that:

“wider ecological requirements must be incorporated into the calculation of sustainable catch (which is then used as a basis for allocations to consumptive user groups) or a specific allocation set aside…to meet these requirements”

Allocation to non-consumptive uses including the provision of ‘no take’ marine protected areas has significant implications for resource management. This is particularly the case where, in addition to broad ecological objectives, a goal is to provide for a higher level of residual stock than would otherwise be necessary to meet sustainability criteria for management of that particular fishery.

The IFAAC sought further policy guidance on this issue; the Minister for Fisheries (IFAAC, 2005 Appendix E) in response noted the complexities of management of marine resources including the impact of a range of actions under different statutory bases including national biodiversity protection legislation, marine parks and fish sanctuary zones. On this basis the IFAAC was advised that the concerns of the conservation sector would be taken into account administratively by the Executive Director of Fisheries in setting of the sustainable harvest levels under IFM and that the Minister was not seeking advice on non-extractive uses of the resource. Effectively this put the question in the general governmental political and administrative arena and outside the specific allocation processes for IFM. There remain potential future complications for IFM, however, as marine reserves can themselves have differential effects on various sectors depending on the distribution of effort and the ability to relocate effort to other locations.

Indigenous use – Primacy, but only for ‘customary’ use

Generally the position of indigenous fishers at law in Australia is that their rights are recognized, but in practical terms are relatively limited (Sparkes, 2006) Indigenous rights are recognised under a combination of the federal and state legislation and also the common law as adopted in Australia. A key limitation on these rights is that they have been held to be of a ‘non-commercial’ nature. For example Section 109 of the Commonwealth Native Title Act 1993 refers to indigenous rights as being; ‘for the purpose of satisfying non-commercial personal domestic ceremonial educational or communal needs’

The IFAAC was directed to frame its recommendations on IFM in the context of a priority allocation to customary fishing by indigenous fishers. No specific direction was given to the IFAAC as to what ‘priority allocation’ means in the context of IFM, however, as a minimum it is likely to mean taking into account the legal rights of indigenous people and provide for an allocation that would allow for some growth in effort and catch to reflect population growth. As actual customary take was estimated to be very low in the first fishery being considered by the IFAAC, policy issues in relation to significant indigenous take have not yet been not fully considered. The recommendations of the National Indigenous Fishing Technical Working Group convened by the Federal Native Title Tribunal give some indication of possible resolution of these policy issues (NNTT, 2005).
Allocation Processes and the Use of Fixed Reference Periods

One of the principles set for IFM (IFAAC, 2005, Appendix A, Paragraph 19) was that in making an assessment of catch shares to make an allocation IFAAC would make an assessment of relative catch shares in 1997-2001. Given a preference for the use of historical catch share as a key element of an allocation, then without a fixed past reference period there is an incentive for sectors to artificially boost their take in the period immediately preceding a likely determination. This acts as a perverse incentive to act in manner that is inconsistent with overall sustainability of fish stocks. Even without acting in this unsustainable manner, at the very least a sector that is naturally increasing its catch share would have a strong incentive to use administrative and political processes delay any allocation for as long as possible improving its relative position (albeit at risk to the sustainability of the fish stocks themselves).

The effect of the rigid adoption of a fixed reference period, however, would be to circumscribe the discretion of the IFAAC in making its recommendations and severely limit the factors it might be able to take into account in making those recommendations. The role of allocation might then be reduced to assessing past catch data. The IFAAC’s response was to advise the Minister that although it would make a best estimate of relative catch shares for the period 1997-2001, that it understood its terms of reference to require it to also take into account broader principles of government policy which include matters such as overall optimal benefit to the Western Australian community from fish stocks.

INITIAL APPLICATION OF IFM - WESTERN ROCK LOBSTER FISHERY

General description – Western Rock Lobster Fishery

As noted above the first fishery to be formally assessed by the IFAAC under the IFM policy was the Western Rock Lobster Fishery. This Fishery is generally described in a range of documents and annual reports are provided in the ‘State of The Fisheries Report’ provided by the Western Australian Fisheries Department in both hard copy and on-line (Penn, 2005). The Fishery principally consists of a commercial and a recreational sector and has a sustainable harvest of between 10 and 12 million kilograms. The commercial sector with in excess of 95% of the catch has around 550 commercial vessels operating and a landed value of approximately $AUD of 250-300 million. The recreational sector is also licensed with an estimate of around 25,000 licenses utilised in the 2003/4 season (Melville-Smith and Thomson, 2005, p64). There is little information available on indigenous customary fishing but it is not thought to be a biologically significant amount for the purposes of overall management of the fishery.

The principal elements used to assess and manage the stock of this valuable resource are long term data sets as to commercial catches complemented with fishery independent recruitment surveys. The fishery is generally considered well managed and sustainable and was the first fishery to achieve certification under the Marine Stewardship Council’s criteria for sustainability (Lestang and Melville-Smith, 2005, p12). Recreational catches are a relatively small component of this fishery being less than 5% of overall catches but showing consistent increases of about 6% per annum over an extended period (Melville-Smith and Thomson, 2005, p63).

Information Adequacy for Allocation – Recreational fishing

The allocation process required a determination of the catch of the relevant sectors. Although the commercial sector was well researched the recreational sector which proportionally is a significantly smaller percentage of the overall fishery has comparatively received less attention. Notwithstanding this
surveys of recreational catch and effort have been taken prior to the commencement of the IFM process including in 2000/01 and 2002/03 (Melville-Smith and Thomson, 2005, pp63-64).

The catch of Western Rock Lobster by the recreational sector had been estimated by a variety of means including creel surveys, mail surveys, phone recall surveys and phone diary surveys. The estimation with the longest data series was the end of season mail survey which involved distribution of letters to a random selection of recreational licence holders requesting that they return information on catch and effort for the past season.

Mail surveys in relation to assessing rock lobster catches by recreational fishers have come under scrutiny in Australia for the effects of bias (Forward & Lyle, 2002), with respondents over estimating their actual catch (and prowess). Concern at the problems of bias in relation to mail surveys of the Western Rock Lobster recreational fishery lead to the implementation of a ‘phone diary’ survey, held concurrently with the mail survey previously used. The ‘phone diary’ survey sought information from fishers as to effort and catch on a more frequent basis. Initial results became available around the time of the IFAAC’s initial consideration of the WRL fishery.

The Department of Fisheries in its first report (2005) to IFAAC on the WRL resource, advised of the proportional size of the recreational sector on original (mail survey) estimates. The Department also advised that preliminary results from the phone diary method suggested an adjustment factor in the order of 1.9. In other words that the likely real recreational catch was nearly half of that estimated on an un-adjusted basis from the mail diary method; the Department later confirmed its views as to the likely true catch levels (IFAAC, 2005, Appendix F).

The effect of this adjustment was likely to significantly reduce the proportion eventually allocated to the recreational sector under IFM. The recreational sector expressed alarm at the impact of the significant reduction of their estimated take for the reference period. From the submission of the recreational lobby group cited above it is clear that from its perspective this issue went to the heart of the credibility of IFM and the allocation process.

Recfishwest (the recreational representational) group advised the IFAAC that:

“Recfishwest is also extremely disappointed with the letter received on 10 May 2005 reinventing recreational rock lobster catch history.”

and later

“While the Department is keen to continually adjust the recreational catch share downwards, they have made no attempt to address the ongoing discriminatory management practices which were based upon faulty data”.

If an allocation had been made on the mail diary estimates and the commercial sector later found out that the best information showed a substantial over-allocation to the recreational sector then no doubt criticism would also have been directed at the Department of Fisheries by commercial fishers.

That a well researched fishery like the Western Rock Lobster fishery can see a significant change in estimates of resource use right up until a cut-off date for allocation highlights the difficulty of decision-making in relation to resource allocations. The Department of Fisheries has since proposed an increase in research activity so as to better estimate recreational catch (Department of Fisheries, 2006a).
Good information as to current and historical share is clearly a relevant factor in allocation and a delay to collect further information would assist in certainty as to the accuracy of estimate in the allocation process. A delay to gather further information, however, poses significant practical problems for any allocation process. In practice the effect might be to defer indefinitely decisions on allocation on the basis of information uncertainty. Furthermore a sector increasing its share of the resource would be advantaged in a deferral of a resolution of allocations and would have an interest in a slow resolution. There would also be advantage in using administrative and political means to strongly question any research findings as to their completeness. In response to these conflicting interests the IFAAC recommended allocations be made but accepted that adjustment may be required (2005, p12). In particular adjustments may be required if better information became available on the recreational catch at a later date. The countervailing interest in allocations becoming certain was, however, also acknowledged and accordingly a time limit of the 2009/10 lobster season was set on any such adjustment.

Comparative and marginal economic and social benefits

IFM Government Policy requires the IFAAC take make recommendations as to ‘optimal resource use’ and that:

“Allocation decisions should aim to achieve the optimal benefit to the Western Australian community from the use of fish stocks and take account of economic, social, cultural and environmental factors. Realistically, this will take time to achieve and the implementation of these objectives is likely to be incremental over time”. (cited in IFAAC, 2005 Appendix A)

Significant economic and social research has been undertaken on the Western Rock Lobster fishery including a recent socio-economic survey (Department of Fisheries 2006b) of the commercial Western Rock Lobster sector. The IFAAC found in its draft report, however, that there was not adequate information on the benefit of shifts in allocation between the two fisheries so as to enable allocation decisions to be made on the basis of benefit to the community as a whole. Essentially a full benefit cost analysis of resource allocation options would be needed to be completed to assay this question and although general observations as to recreational and commercial participation and expenditures were outlined in material prepared for the IFAAC (Department of Fisheries, 2005), is valid in itself that paper did not necessarily assist in the exercise of assessing the marginal benefits of shifts in resource allocation. The difficulty of assessing the benefits of marginal shifts in resource allocation is discussed by McLeod and Nichols (2004) in a paper prepared for Australia’s Fisheries Research and Development Corporation.

Incremental Change - Pragmatic Approach

In the context of the challenges outlined above, the IFAAC in its draft Report came to a view that its approach should be incremental and pragmatic in relation to allocation and changes in allocation (2005, p11). This decision is consistent with an appreciation of the real difficulty in changing existing resource shares as well as demonstrating benefits that might arise from a substantial change to existing resource shares. To the extent that recommendations represent a change in resource shares the IFAAC concluded that this would need to be explained in the context of optimal benefit to the Western Australian community. The incremental and pragmatic approach is also reflected in the recommendation that, notwithstanding that the information base may be questionable in some aspects, specific allocations should be made as management should not be deferred to an indefinite period in the future. Finally the IFAAC put strong emphasis in its draft Report (ibid, p32) on the necessity of developing ongoing re-allocation mechanisms contemporaneously with the impact of IFM to allow for resource shifts over time.
DISCUSSION

Information Base for Allocation under IFM

The development of formal allocations for IFM in relation to the Western Rock Lobster Fishery highlighted the different information demands on research and management arising from integration of fisheries sectors and explicit allocation of a share of the resource to those sectors. In relation to the three sectors associated with the Rock Lobster Fishery two were of relatively minor importance, being the recreational and indigenous fisheries. Solely from a species stock management perspective the most important research objective is to measure the impact of the commercial fleet, with in excess of 95% of the overall catch.

Given limited resources, a rational approach to questions relating to overall sustainability is to adopt a risk oriented approach to allocation of research dollars. Arguably, until the adoption of IFM, a rational allocation could justified as only allocating sufficient research effort to the recreational sector to have an approximate estimate of catch as well as a measure of the rate of increase of effort. Prior to IFM, the mail survey data series on recreational fishing would appear to have met this modest criterion, given the past scrutiny of bodies such as the Marine Stewardship Council as to sustainability. The demands of IFM require more fine scale to monitor each sector. The fisheries management issue at hand is not only as to whether overall effort sustainable, but also whether each sector is acting so that its caches are within its allocation. The Western Rock Lobster fishery shows that even for a well researched and understood fisher this is a significant and easily underestimated challenge.

Inter Sectoral Re-allocation

The difficulty of assessing relative benefits of allocation of fish resources between different sectors has been the topic of significant discussion Australia, including the subject of a research project for Australia’s Fisheries Research and Development Corporation (McLeod and Nicholls, 2004). The IFAAC in considering the Western Australian implementation of integrated fisheries management, adopted in its draft report a general rule that any recommendation that had the effect of a change in catch shares would need to be explained on the basis of guiding principles including optimal benefit. Taken together with an incremental and pragmatic and the overall status quo approach associated with the adoption of in historical reference periods for catch shares the effect of these measures has been put the burden of proof of public benefit to proponents of significant change. Given the paucity of data and information especially as to social benefits and the likely contested nature of any attempt to assess the social incremental costs/benefits of resource reallocation would appear to make major shifts through administrative action an unlikely outcome of this process.

The emphasis by the IFAAC on the adoption of a reallocation mechanism, including consideration of a market based mechanism, rather than administrative reallocation can be seen as directed at encouraging sectoral lobby groups to assist in the development of long term mechanisms rather than expend their efforts in lobbying for short term/reactionary changes. By making the costs of re-allocation more transparent information is provided to both the users of a resource and the community as to optimum use. For example research carried out into optimum uses in the abalone fishery in Western Australia (McLeod & Nichols, 2004) has identified that in the Western Australian abalone fishery, although there might be some relatively minor benefits of allocation between the recreational and commercial sector, better allocation within the recreational sector was more likely to yield significant and substantial benefits.
Conclusion

In relation to integration of uses of a marine resource, the lowest level of integration can be thought as integration within a sectoral level, for example small and large scale commercial fishers within a commercial quota scheme. The next level up of integration is to integrate all consumptive uses of marine resources, the next level further up integration of consumptive and non-consumptive uses of marine resources.

In Western Australia, formal integration at the first of these levels, all sectors involved in consumptive uses, has been formally adopted as an objective, and specific mechanisms have been instituted to achieve integration. The first fishery the subject of this process has highlighted the difficulties of fully implementing integrated fisheries management even in a sustainably managed fishery that has been the subject of substantial research efforts over an extended period. The experience so far suggests that integration of fisheries management, even if merely at the sectoral level, will pose significant resource demands for information of a higher quality as to sectoral impacts on resource stocks and to sustain ongoing sectoral management.

The difficulty of assessing as to relative benefits to guide re-allocations through administrative process highlights the importance of including as part of integration specific mechanisms to allow and encourage resource flow to the sector which most highly values it. Market based mechanisms within rights based systems raise the prospect of making explicit relative values for marine resources, however, considerable development is still required in this area.

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ENDNOTES

The Author was a member of the IFAAC at the time of writing, but the opinions expressed in this paper are personal. The advice of fellow IFAAC members and staff is, however, acknowledged and thanked. Most of the material referred in this paper is available on-line. Additional information is also available on-line including submissions of various parties to the IFAAC. These can be found as at 1 August 2006 at the Fisheries Department of Western Australia Website http://www.fish.wa.gov.au .