

The role of recreational and commercial values in the recreation and commercial management of multi-use fisheries—application to Western Australian salmon

P.B. McLeod

*Department of Economics
University of Western Australia
Nedlands WA 6009*

Introduction

Allocation of fish species within and between competing user groups is emerging as perhaps the most important fisheries management policy issue of the next decade. In Western Australia a variety of allocation issues are emerging. In particular, the allocation of the Australian salmon and herring resource between and within the competing user groups has acquired a high profile. The recreational sector has argued that there is increasing recreational demand for these species, that the recreational value of the species is high and that the current arrangements for determining access or allocation are inappropriate. They are perceived as being inequitable.

On the other hand the commercial sector has argued that there is a significant misunderstanding regarding the stock position for these species and their behaviour. They argue that the difficulties experienced at some times at some locations by recreational fishers are not a function of commercial activity but are rather attributable to the unique biology of the species and

lack of education of recreational fishers as to when and where to fish. They argue that with appropriate education of recreational fishers both commercial and recreational fishers can share the resource for the foreseeable future. In addition they note that commercial restructuring of the industry as a consequence of declining returns is already reducing effort.

Both commercial and recreational fishing groups recognise that the recreational fishery has been developing steadily, but that there are inadequate data on the catch and participation levels or on the economic value of the recreational fishing activity. At the same time they recognise that there is still considerable work to be done to further refine our understanding of the biology of these species, especially herring.

Resource allocation: the management challenge

Fisheries management has traditionally concentrated on exploitation of fish stocks by a single user, commercial fishers.

The common property nature of fisheries has meant that stock depletion and resource depletion have been the focus of management, with a variety of management options being developed to correct for inefficient commercial exploitation.

These include:

- licensing to create limited entry fisheries and regulate fishing effort
- licensing to create output control in the form of total allowable catch quotas extending to individual transferable quotas.

Only recently have recreational fishers been recognised as posing a threat to some fisheries. As a consequence there are restrictions on recreational fisheries including:

- gear restrictions, closed areas and seasons
- output controls including bag and size limits.

In Western Australia, the above basic approaches have been adopted to apportion the catch between commercial and recreational fishers. Detailed regulation of the commercial sector using a mixture of input controls has evolved while the recreational sector is regulated with a mixture of bag limits, size limits and gear restrictions. In some cases, the fishing activities of both user groups are regulated to take place during defined times and seasons. This time allocation is usually designed to share the catch more equitably and also prevent spawning stocks from being overfished.

The range of restrictions that are currently applied to each sector have evolved and been implemented in a somewhat *ad hoc* manner, reflecting the traditional emphasis on commercial management and the recent growth in recreational demand. That is they

have been implemented in response to specific concerns about biological sustainability, or about the level of conflict or potential conflict between recreational and commercial fishers, as these issues have arisen.

A general framework with a consistent approach to resource allocation between competing users based on clear definitions of resource security and access rights and setting out the principles for resource sharing and the processes to be used to reallocate resource stocks has not yet emerged in Western Australia, or elsewhere.

Current regulation of Australian salmon and herring

Australian salmon and herring are typical of the general situation. For Australian salmon, there are licences for commercial operators. On the west coast these licences entitle the holder to fish any available beach whereas on the south coast, each licence is tied to a specific beach. Commercial operators have priority on all beaches. Licences are transferable under specified conditions and transfers need to be endorsed by the Fisheries Department. There were controls through a Total Allowable Catch (TAC) but this is not currently being used.

The recreational fishers of Australian salmon must comply with bag and size limits, must give priority on beaches to commercial operators and are not allowed to net.

The current regulations, especially the restriction to fish from beaches, are believed to place an effective limit on commercial catch potential for any given number of operating licences.

Most commercial salmon licence holders also have herring endorsements. The commercial herring licences are currently tied to the related south coast salmon licences. These commercial herring licences are transferable under specified conditions and the transfer must be endorsed by the Fisheries Department. For the recreational fisher there are bag limits.

In the case of Western Australian salmon, the licensing has been area based to restrict effort even further. On the south coast commercial fishers are licensed to designated beaches. On the south west coast, they are licensed to the area but not specific beaches. Up until two years ago there was a TAC. Licences are transferable.

Competition between commercial and recreational fishers

Recreation demand is increasing all around the world. This has created intense competition for the resource between commercial and recreational fishers. This creates a major management problem in the form of resource allocation.

The questions arising out of this allocation issue are:

- how can recreational and commercial exploitation be jointly managed to prevent overexploitation of the resource?
- what access rights do commercial, recreational and other groups have to the resource?
- what is the objective of allocation and what decision rules will best allocate fish stocks between competing groups both spatially and temporally?

- which management regimes will best suit the achievement of the allocation objective?

Western Australian salmon and current concerns in regulation and allocation

Over recent years, concerns have emerged regarding the effectiveness of the current management regime for the Western Australian salmon and herring fisheries. The concern is that the regulation does not adequately deal with the emerging and potential future competition for the resource between commercial and recreational fishers and that it does not cause the resource to be shared fairly and efficiently between the two user groups.

Extent of recreational demand

Detailed information on the level of recreational fishing activity and the level of recreational catch for salmon and herring in Western Australia is not currently available, and there has been considerable debate as to the extent to which the recreational sector is beginning to infringe on commercial activity.

A creel survey is currently being undertaken through the Fisheries Department and is scheduled for completion in the 1995 season. This will provide harder data on the numbers of recreational fishers and the extent of their catch.

However there is strong anecdotal evidence for increased recreational demand backed by some statistics. The 1987 ABS survey of recreational fishing activity (Australian Bureau of Statistics 1989), documented the extent of recreational fishing. It estimated

that up to 30% to 40% of the population over 15 are recreational fishers. It also indicated that 40% of recreational fishers target herring as their preferred fish and that 12% fish for salmon. Herring is now widely regarded as the most important recreational fish species in Western Australia.

The emergent competition for the fish resource has been most intense in fisheries close to the metropolitan area.

Fish access versus beach access

There is a growing recognition of the importance of understanding the nature of access and competition for access. In particular for salmon, there is a need to recognise the distinction between beach and fish stock access.

Fishing for salmon in particular requires access to both the fish stock and to a location from which to fish. Not surprisingly therefore some of the emerging conflict discussed revolves around access to beaches. This applies to both the commercial and recreational fishers wishing to fish the same shore, but also to non commercial beaches where recreational fishers conflict with some environmental protection groups in seeking access to beaches. The issue of beach access currently and in the future is tied to the overall management policies for the coastal environment and associated areas. Many of the potential fishing beaches are in, or require access through, National Park land and this may conflict with the management policies that agencies such as the Department of Conservation and Environment (CALM) wish to follow in these areas.

Fishing entitlements

Recreational or commercial fishers do not have individual explicit entitlements to the annual salmon and herring catches in Western Australia. The commercial sector is regulated by licensing the number of fishers. This is combined with regulating the area in which they can fish and restricting their operation to working from the beach. Control of salmon catch has been controlled in the recent past with a TAC quota, but as noted previously, this approach has not been used in recent seasons. The TAC concept was opposed by the commercial sector as a management device for the fishery.

In the absence of a formal TAC, it has been argued that when reallocation is desirable or desired, it can be difficult for recreational fishers to negotiate directly with commercial users for a greater share of the catch because there is no explicit recognition of what rights each sector has to the fish resource.

Under the current approach, if it is thought desirable or necessary to give recreational fishers a larger share of the salmon or herring resource, then it is necessary for the government to intervene. The government is able to take the necessary decisions that will result in a resource shift. However, in the absence of well defined rights associated with licences even this can be complicated when issues of compensation arise.

Economics and resource sharing

The emergence of resource sharing or allocation issues in a sense gives economics its strongest rationale for involvement in fisheries management because competition for scarce resources is the fundamental business

of economics and, even more important, is the *raison d'être* of markets.

From an economics perspective the appropriate approach is relatively straightforward. Essentially it is to bring market discipline to the allocation of stocks between competing uses either in the form of

- actual markets based on defined property rights, or
- implicit markets based on cost benefit analysis and direct allocation.

It is the practical implementation of either of these two approaches that is the real issue, in particular defining the appropriate role of government.

The problem

Most management regimes do not create clearly defined property rights to effective shares of the harvest, so that resource shares vary with effort by each group. This is always likely to lead to conflict and will generate fundamental questions about access rights. Security of access and tenure is in most markets a prerequisite for allocation efficiency, but is not an attribute of many fisheries.

Elements of an ideal solution: market allocation

Based on this definition of the problem, then from an economic perspective the elements of an ideal economic solution that accounts for efficiency and equity are relatively straightforward. They are to:

- replace common property with private property rights to the greatest extent possible, subject to the rights of the fisheries manager (the Government) to

adjust the harvest in accordance with an overall management plan

- establish the private property rights in a way that transcends the commercial and recreational activities, that is it recognises the rights of both non commercial and commercial players in the total allowable catch, and
- use the establishment of private property rights to create a market in the form of tradable quotas or catch share.

There are clear advantages to this approach. These are generally well known and include:

- bringing commercial and non commercial activity within the common management framework
- fish stocks will be allocated through trading to those groups that value them most
- a basis for compensation for existing commercial licence holders exists
- trade drives allocation not direct government intervention
- biological control (usually allowable catch reductions) can be 'purchased' through intervention in the market to achieve marginal adjustments within the management plan.

While the above advantages need to be fully appreciated they are often all that are emphasised. However, the potential economic benefits of such a system need to be put into perspective and balanced against the costs associated with such a system. In particular we can point to some clear difficulties including:

- transactions costs
Markets have to be policed and prosecuted, and policing recreation compli-

ance with a market share allocation could become very costly, almost impossible in some cases. Depending on the value of the fishery, the transactions costs could dissipate the increase in net economic value generated by the management system.

- initial allocation

The initial allocation needs to be determined in a way that is equitable and contains an element of certainty. This presumes that the 'biological' information is such that a current and future allowable catch regime can be set down to initiate the market. For established fisheries there are likely to be commercial licences in operation that establish some kind of allocation.

- asymmetry in transactions costs

Related to the allocation and transactions costs issue. The default is that existing fishers with licences and in some cases defined catch quota are usually commercial fishers. Resource allocation changes are likely to be towards recreational fishers. There may well be asymmetries in the transactions costs, which make it relatively more difficult to organise recreational fishers to 'bid' for licences than to elicit bids from commercial fishers.

- thin markets

Apart from some rare exceptions, most quota markets in which recreational resource allocation is an issue are likely to be very 'thin' markets. They are unlikely to provide the robustness needed to guarantee that prices represent opportunity values.

- ownership concentration

In many cases, especially thin markets, ownership and control may become concentrated and collusion may occur, further jeopardising the price determination process.

- independence in initial allocation

The fisheries authority setting the initial aggregate and individual allocations needs to be independent.

Unfortunately, these difficulties militate against any simple market solution for resource allocation. In most cases, some form of direct allocation would seem to be favoured, combined with market transactions where appropriate.

The clear objective emerging from economic analysis is that fish stocks need to be allocated so as to maximise the value of the fishery to society. Fundamentally this is an efficiency objective and would allocate and reallocate fish between competing uses according to where the marginal value was highest. This is exactly what a competitive market does, and it is this process that is the benchmark for direct allocation intervention.

Relevant values and lack of values

It is important to realise that if direct allocation is to determine resource allocation shares, then the relevant economic assessment is cost benefit analysis. That is each competing use needs to be assessed in terms of the net benefits conferred on society in economic terms from its use of the resource.

For example for commercial use, we need the net economic value of the fish resource reflecting competitive market prices and the opportunity of all resources required to

produce the commercial output. For recreational use this means assessing the net willingness to pay by recreational fishers, that is gross willingness to pay, less the costs of 'producing' the recreational fishing experience.

This poses particular difficulties for recreational activities because of the lack of markets. Expensive techniques such as travel cost model and contingent valuation surveys are needed to assign relevant values. These approaches must be able to account for the fact that for recreational fishing there are joint outputs and inputs. For example for Western Australian salmon, the actual catch and the quality of the experience, including location, are relevant joint outputs while the required resources include both access to fish stock and access to beaches from which to fish.

As a consequence the usual situation is a lack of relevant values to input into resource allocation deliberations.

It is important to note in this context that economic impact studies will not suffice to make the decision. They are however valuable in identifying regional economic or distributional implications of alternative fishing activities.

Relevant management regimes: lessons based on Western Australian salmon

The situation of Australian salmon, currently being considered by the Australian Salmon and Herring Resource Allocation Committee (ASHRAC) in Western Australia, illustrates all of the above issues, and indicates the key elements of an acceptable resource allocation process.

No clear property rights; establish benchmark rights

In the absence of a clear definition of the rights and entitlements that go with a licence, in most cases a commercial licence, optimal resource reallocation is difficult to achieve. It is difficult to know just what the commercial fisher is losing and what the recreational fishers are gaining. Hence it is difficult to assign acceptable values to the 'rights' in order to achieve market based reallocation. This issue has been recently recognised in Western Australia when the Fisheries Portfolio Review recommended as part of its implementation programme the establishment of a working group to investigate issues of security of access in fisheries.

Stock versus amenity, resource sharing management

Any allocation process must begin from an understanding of the stock position. For example for Australian salmon, the assessment is that stock is fully exploited but not under threat. Therefore we have a resource sharing issue based on relative economic and social values between competing uses. This presupposes either the availability of data on which to base these relative value assessments or the existence of a process (usually market based) than can establish them.

Management without values: appropriate approaches

For most fisheries the values needed will not be available, especially for recreational activity. Moreover in many cases they will be expensive to obtain and the cost may not be justified. For Australian salmon, there is no detailed knowledge of the recreational catch and no real knowledge of recreational values, although the creel sur-

vey mentioned previously and an associated contingent valuation survey will clarify the position.

However, for many fisheries, although values are not available, the direction of change is clear based on limited evidence and differential growth rates in demand.

Thin markets

For most fisheries, independent assessment of market transactions will be needed because of the small number of licences likely to be traded. Any allocation process must be able to cope with this problem.

Dynamic framework needed

No simple market or direct allocation will work. A resource sharing framework is needed that reflects the above points and which establishes a reallocation process that can account for the emergence of new pressures over time and for the dynamic adjustment that will therefore be required.

Further reading

- Australian Bureau of Statistics (1989). Recreational Fishing in Western Australia, July 1987. Catalogue no. 7602.5.
- Charles, A.T. (1992). Fishery Conflicts: A Unified Framework. *Marine Policy* (September), 379-393.
- Cauvin, D. (1980). The Valuation of Recreation Fisheries. *Canadian Journal of Fish and Aquatic Science* 37, 1321-1327.
- Edwards, S.F. (1990). An Economics Guide to Allocation of Fish Stocks between Commercial and Recreational Fishers. *NOAA Technical Report NMFS 94*.
- Fisheries Department of Western Australia (1994). Report of the Fisheries Portfolio Review.
- Lal, P., P. Holland and P. Power (1992). Competition Between Recreational and Commercial Fishers: Management Options and Economic Research. *Economic Research Report 92*. Canberra: ABARE.
- Lindner, R.K. and P.B. McLeod (1991). The Economic Impact of Recreational Fishing in Western Australia. Fisheries Management Paper No. 38. Perth, Fisheries Dept of WA.
- McLeod, P.B. and C. McGinley (1994). Economic Impact Study: Commercial Fishing in Western Australia. Fisheries Management Paper No 61. Perth, Fisheries Dept of WA.
- MacReadie, M. (1993). Resource Sharing. *Australian Fisheries*, (July), 8-11.
- Monaghan, P J. (1991). A Study Into the Feasibility of Establishing a System for the Buy Back of Salmon Fishing Authorisations and Related Endorsements. Fisheries Management Paper No 44. Perth, Fisheries Dept of WA.
- Recreational Fishing Advisory Committee (RFAC) (1990). The Future of Recreational Fishing: Issues for Community Decision.
- Western Australian Fishing Industry Council (WAFIC) (1994). The New Fisheries Act. Discussion Paper. Perth: WAFIC.
- Young, C. (1993). Salmon: Sharing the Catch. *Western Fisheries* (Autumn), 16-23.