
NEW DIRECTIONS FOR
COMMONWEALTH FISHERIES
MANAGEMENT IN THE 1990s

A Government
Policy
Statement
December 1989

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Foreword

This policy statement presents a blueprint for the future management of those fisheries which are under the control of the Commonwealth. The document is therefore important because it explains why the Commonwealth Government is making certain changes and how things will be done in the future.

One thing that is not going to change is the inherent difficulty of fisheries management for all involved.

It is difficult for fishermen because the management activity almost always imposes restrictions of one sort or another on them as well as additional paperwork.

It is difficult for the Government because it is responsible to the whole community for the conservation and utilisation of a resource which belongs to the people and about which there is great uncertainty.

The fisheries managers themselves are caught in the middle, between the interests of commercial business and those of the Government, which has responsibility to the general public and to future generations.

In the recent past the key landmarks in fisheries administration have been the declaration of the Australian Fishing Zone in 1979 and the implementation starting in 1983 of the fisheries provisions of the Offshore Constitutional Settlement. The first extended the area of responsibility for the Commonwealth Government from 12 to 200 nautical miles offshore. The second provided the basis for the Commonwealth and the States to agree whether the administration of a particular fishery should be done by one or other of them, or jointly. The normal arrangement remains that, unless other agreement is reached, the States control fishing in waters out to three nautical miles and the Commonwealth from three to two hundred.

As the particular needs of the industry have ebbed and flowed, there have also been changes in emphasis in the operation of the Australian Fisheries Service, the Division of my Department with responsibility for fisheries management. All the while there has been an emphasis on consulting with the States, industry and scientists, and this has taken up a great deal of time and energy.

Despite these efforts, there is still a feeling among some fishermen that they are not closely enough involved in the estimation of stocks, the setting of management objectives and the operation of the management plans. The Government accepts this but not the idea of total 'self management' for the industry.

Simple notions of self management understate, in my view, the inherent difficulty of the tasks set for fisheries managers and scientists. Overall I have been most impressed with the level of service both groups have given to the industry. But no amount of consulting, of administrative ability and of integrity can overcome the fact that fisheries management is conducted — if not in the dark — then in a gloomy half-light such as I understand is inhabited by the orange roughy.

Despite the considerable success of fisheries research we will never be able to illuminate the situation entirely, so the management of our fisheries will still have to be characterised by enough caution to ensure that stocks remain for future generations. In other words judgement will continue to be necessary in fisheries management, for the incontrovertible facts are few and far between. Against this uncertain background, the relationship between fish stocks, their utilisation, and the environments in which they live and are harvested will remain the central focus of attention for managers, scientists and industry alike.

This statement begins a new era in the Commonwealth's administration of Australian fisheries. Since I took over responsibility for Commonwealth fisheries management in 1983, a number of significant changes have been effected. A great deal has been achieved. This statement represents a further development and outlines directions for fisheries management into the 1990s. These changes will allow Ministerial involvement to concentrate on the broad strategies rather than the detailed day-to-day administration.

It seems to me to be symptomatic of the nature of fisheries management that even the fundamental change in the public administration of fisheries we are ushering in with this statement has depended on the exercise of long experience and mature judgement. I am confident that the decision the Government has taken is the correct one.

All of these things are spelled out in considerable detail in this statement. I hope that as many people as possible read it, for that in itself will increase understanding of the roles of governments, industry, managers and scientists. The ultimate aim is better, and potentially cheaper, fisheries management.

The essential points from this statement are covered in *Fishing For A Future*, the summary document which is freely available from the Australian Fisheries Service in Canberra. I commend to you both this statement and the summary.

A handwritten signature in black ink, reading "John Kerin". The signature is written in a cursive, flowing style with a large initial 'J'.

John Kerin
Minister for Primary Industries and Energy

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Summary

Governments have a vital role in fisheries management. Experience worldwide shows why unregulated fisheries tend to be over-exploited. Over-exploitation of a fishery at the very least means lower returns from the fishery and at worst can lead to elimination of biological species. Australian fisheries are not excepted; witness the severe depletion of southern bluefin tuna and declining catches in the South East Trawl fishery.

The cause of this over-exploitation is simple. Fisheries resources are publicly owned, being at once everybody's and nobody's. The lessons of economics are clear: when resources belong to nobody, nobody will look after them; when resources belong to everybody, everybody *must* look after them. It is up to government to establish incentives that will ensure fisheries are exploited so as to provide the best return to the people in the industry and to Australia as a whole.

This policy statement sets out wide ranging and comprehensive changes in the policies for efficient management and administration of the nation's fisheries resources. It spells out clear objectives and criteria to apply in formulating management plans; new streamlined administrative arrangements; the need for a full review of the suite of fisheries legislation; and how the Government's principles on research and on the environment already released in separate policy statements, will be applied consistently to the fishing industry.

The new directions for fisheries management are summarised in Figure 1.

Objectives behind management controls

The three overriding objectives of the management controls outlined in this policy statement are:

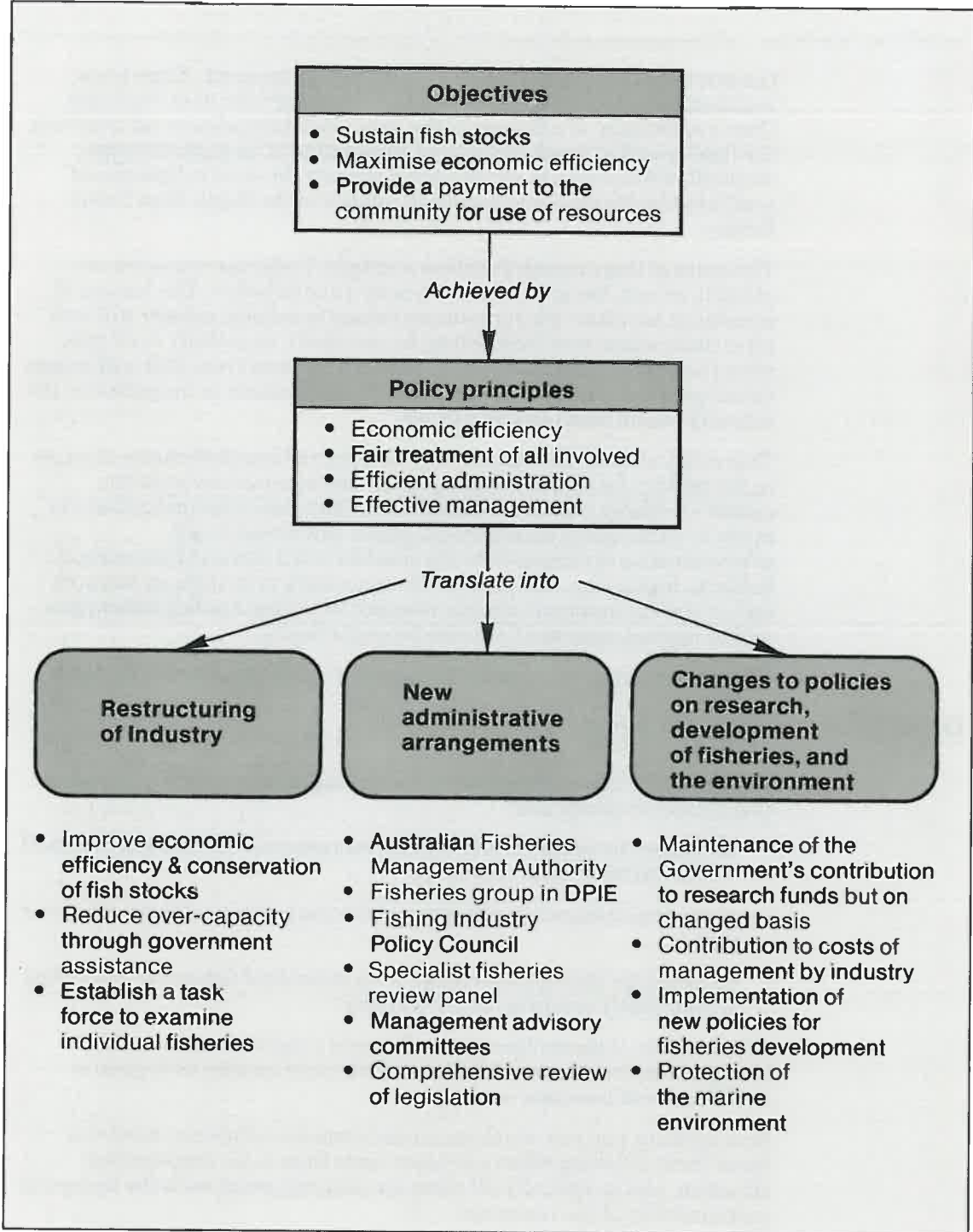
- to ensure the conservation of fisheries resources and the environment which sustains those resources;
- to maximise economic efficiency in the exploitation of those resources; and
- to collect an appropriate charge from individual fishermen exploiting a community resource for private gain.

Achievement of these objectives will create a stable economic and biological environment in which fishermen can operate with greater confidence and economic security.

Management controls which maximise economic efficiency involve a lower level of fishing effort and lower costs than in an uncontrolled situation, and in virtually all cases are also consistent with the biological sustainability of the resources.

Because of the lower costs associated with the reduced effort under controlled management the profits from exploiting fisheries resources are increased. But fisheries resources are the property of the Australian people and it is appropriate for a charge to be imposed where private individuals gain significant benefits from the exploitation of a public resource.

Figure 1
 New directions for fisheries management



Criteria for preferred management controls

The Government's objective in determining the management controls to be used in a fishery is simple: to foster a dynamic industry without compromising the biological or economic objectives of fisheries management. In practical terms, this objective means the following principles should be followed:

- management controls should not distort the way economic resources are allocated (economic efficiency);
- similar people in similar circumstances should receive similar treatment (social equity);
- management controls should be straightforward and clearcut (administrative efficiency); and
- management programs should contain clear objectives and the controls should be periodically tested against the aims (management effectiveness).

One of the dangers of regulation — which there must be in fisheries — is the possible loss of efficiency as a result of fishermen using inappropriate fishing techniques or capital equipment. Fishing is usually constrained by some form of restriction on output, such as a quota, or on inputs, such as boat numbers or net sizes. Each fishery has special characteristics. In some cases input controls such as restrictions on the total quantity of fishing gear are appropriate; in other cases output controls are appropriate. In some situations regulations are essential to protect the environment, for example the restrictions on driftnets.

A common problem with input constraints is that there is usually scope for getting around them, generally in a manner which raises costs. Constraints on output or catch are likely to involve less inefficiency, although there is still the potential problem of output quotas reducing the incentives for fishermen to use the most efficient fishing techniques. Ideally, the most efficient fishermen should be able to expand their activity at the expense of the less efficient. To allow this, the preferred management measure is one that allows market forces to operate. In general, this means using individual transferable quotas. Before other management controls are used, fishery managers will have to demonstrate that these controls are superior to transferable quotas for a particular fishery.

However, as most fish populations are subject to quite large environmentally generated fluctuations it is essential that any system of output controls has sufficient flexibility to permit the total allowable catch to be varied accordingly.

For these principles to result in efficient and effective management policies there must be two-way communication between fishermen and fishery managers. To foster communication the Government will enhance the role of management advisory committees and encourage research bodies to present their findings to the industry clearly and concisely.

Cost recovery

Fisheries have to be managed to maximise the benefits from the resources for the nation and for the people in the fishing industry. But management is costly and the question is: who should pay? Again, the principle to be followed is clear: those who benefit should pay the cost. The available evidence indicates that around 90 per cent of the market benefits from management go to fishermen. This is the current rate of cost recovery for attributable management costs in some fisheries. The proportion of costs recovered will be reviewed by the Industry Commission before the end of 1991 and every five years thereafter.

A clear distinction between who pays for management costs and who 'owns' the resource needs to be made. Management costs are like any other necessary input such as fuel, except that they are a common cost and require government regulation. Just because people in the fishing industry pay for the necessary management input does not give them ownership of the resource, any more than paying fuel bills gives fishermen ownership over fuel supplies.

Access to new and existing fisheries

All the available evidence indicates that the possibility of finding significant new fisheries resources in Australian waters is low. It is imperative therefore that the Government ensures the sustainability of existing and developing fisheries.

The existing access rights held by fishermen are inadequately defined. In order to provide security of access the Government will formally recognise the ongoing nature of rights in existing developed fisheries. These access rights will be subject to the management conditions applying to a particular fishery. The Government will also establish a formal register of fishing rights which will provide improved documentation of rights held.

The Government reaffirms its previous undertaking that existing rights in established fisheries will not be reallocated through auctions or competitive bidding.

The development of new fisheries needs to be undertaken in a controlled fashion in order to avoid the problems of over-exploitation and over-capitalisation which occur in many of the existing fisheries.

The risks (and costs) in developing new fisheries are high, so there must be sufficient incentive for the industry to accept these risks. The policy challenge is to balance the need for controls over new fisheries against the need for sufficient incentives to explore and develop them. Therefore:

- the Government will continue to be directly involved in exploratory fishing on a limited basis and will provide incentives to encourage the industry to participate in exploratory fishing;
- the Government will enter into commercial agreements with operators to undertake fishing which will test commercial feasibility. Such contractual agreements will be for a limited time only;

- there will be competitive bidding to allocate fishing rights for both feasibility fishing and commercial operations;
- when the commercial viability of a developing fishery has been established a formal management plan will be introduced;
- exploratory or feasibility fishing will be open to foreign operators provided that the Australian community benefits from their fishing. Once commercial exploitation is commenced Australian fishermen will be given preference over foreign operators providing that the net economic benefits are not significantly less than could be obtained from foreign exploitation; and
- consistent with the Government's policy of maximising returns to the Australian community, foreign fishing access fees will be periodically reviewed.

A new appeals body

The social equity principle requires natural justice and the right of appeal for an individual. While the Administrative Appeals Tribunal has protected the rights of individuals, some of its past decisions have not considered the wider impact of individual increases in the allocation of fishing rights on other individuals in a fishery or on the management of the fishery. The Government has therefore decided to establish an independent specialist review panel which will review decisions on the allocation of fishing rights, having regard to the wider impact of those decisions on the fishery as a whole.

Enhanced restructuring

For those fisheries which are already over-capitalised, the management solution which meets the biological and economic efficiency objectives invariably involves reducing fishing capacity. That means considerable restructuring in the fisheries involved.

While adjustment schemes are already in place in some fisheries, the restructuring is considered unacceptably slow and its outcome uncertain. Accordingly, the Government believes it should actively assist in reducing over-capacity in the industry. This will generally involve the Government taking the initiative and committing up-front some financial resources.

The restructuring will considerably improve the profitability of fishing operations. Because the community is entitled to collect an appropriate return for the private use of a public resource, the industry has to accept that appropriate charges will be introduced as its profitability increases following the restructuring.

The Government will establish a task force to examine and make recommendations on structural adjustment on a fishery by fishery basis. This task force will include representatives from the Government and the industry and will advise on the most appropriate ways to undertake the restructuring and to recoup a major share of the increased benefits for the community.

Improved research funding

Currently, fisheries research is administered through four mechanisms: the Fishing Industry Research and Development Trust Fund (\$7.5 million expenditure in 1989–90); the Fisheries Development Trust Account (\$0.3 million in 1988–89); special research levies (\$0.4 million collected in 1988–89); and the Torres Strait Research and Monitoring Program (\$0.6 million expenditure in 1988–89).

In addition, CSIRO and the Australian Bureau of Agricultural and Resource Economics and the Bureau of Rural Resources in the Department of Primary Industries and Energy make a significant contribution to fisheries research. CSIRO alone undertook fisheries related research projects valued at \$9 million in 1988–89.

The Government will continue to support fisheries research, but the basis for funding will change to be consistent with the policy statement on this subject released in May 1989.

In that policy statement three important principles relevant to fisheries research were detailed:

- research should be undertaken only if the likely benefits exceed the costs;
- the industry should pay for the research in proportion to the benefits it receives from the research; and
- governments have a legitimate role in industries like fishing where community benefits also occur. Significant external benefits for society are likely in the case of fisheries research.

To be consistent with the Government's policy statement on research and development in the primary industries portfolio, the funding arrangements for fisheries research will be as follows:

- in recognition of the natural resource characteristics of the industry, the Government will provide unmatched research funds to the Fishing Industry Research and Development Trust Fund of 0.5 per cent of the gross value of fisheries production;
- the Government will match contributions from the fishing and aquaculture industries to the Trust Fund up to 0.25 per cent of the gross value of fisheries production;
- there is a difference between research which is specific to the management of a fishery and research which has wider industry benefits. Increasingly, the industry will be required to pay for specific management related research as part of its funding of management costs; and
- the Government will provide further funding equivalent to 0.25 per cent of the gross value of production to supplement management research where industry contributions are insufficient, and to expand the role of the two research bureaux in the Department. Therefore there will be an overall upper funding limit by the Government of 1.0 per cent of the gross value of fisheries production.

The functions presently served by the Fisheries Development Trust Account will be subsumed under the new research funding arrangements and the Account will be phased out when its current research programs are completed.

Environmental protection

The marine environment is a valuable resource and the Government fully accepts its responsibility to conserve and protect that environment.

A good part of the protection of the environment will be achieved if the management objectives outlined in this statement are achieved. These objectives will ensure biological sustainability of the resource.

To assess the impact of economic activities like fishing on the environment, the Government has established the Resource Assessment Commission. This body is to advise on the best use of the nation's resources having regard to development, conservation, sustainability and equity. Moreover, its operations should facilitate public scrutiny of resource use decisions.

Among the first references sent to the Resource Assessment Commission is coastal zone management. Coastal development and pollution are issues which can greatly affect the fishing industry, either directly or through the food chain.

While the Government will pursue controls over deleterious practices such as driftnet fishing, every encouragement will be given to the industry to adopt sensible codes of practice — fishing techniques which minimise by-catches being an example.

In recognising the damage which introduced diseases and exotic species can cause to Australian waterways, the Government stands by its commitment to rigorous quarantine standards and will develop, with the States, rigorous standards for aquaculture activities.

Recreational fishing

Recreational fishing is one of Australia's most popular outdoor activities and this policy statement recognises those interests and its links to commercial fishing.

The policy principles that apply to commercial fishing also apply to recreational fishing. Fisheries resources belong to the community at large and governments must ensure the correct incentives are in place to care for fisheries stocks. While the actions of any one recreational fisherman may not seem significant, their collective action places considerable pressure on fisheries.

While most recreational fishing takes place in fisheries for which the States have management responsibility, some, like game fishing, take place in fisheries under Commonwealth jurisdiction. Recreational fishermen operating in some State managed fisheries already face daily catch and size limits. Similar controls may become necessary in Commonwealth managed fisheries.

Under the review of legislation described later, provision will be made for regulating recreational fishing as well as commercial activities to enable the effective management of fisheries.

The same principles of efficient administration and cost recovery will also apply to recreational fishing. Those who benefit most should pay most. This has to be balanced by considerations of equity and administrative efficiency. The large numbers of people involved in recreational fishing will in general mean it is not practical to collect a levy or licence fee. However, semi-commercial operations catering for amateur fishing activities will be required to contribute to management costs.

Recreational fishing interests will be represented on bodies such as the management advisory committees and the new Fishing Industry Policy Council.

Streamlined administrative arrangements

To streamline the administration of management programs, the Government will establish the Australian Fisheries Management Authority. This new statutory authority will be the mechanism by which the Government undertakes its fisheries management responsibilities. The main organisational links in Commonwealth fisheries management are summarised in Figure 2. A group within the Department of Primary Industries and Energy will have responsibility for broad fisheries policy matters.

The principal advantage of the new Authority is that it will enable the Government to effect its responsibilities in a flexible, open and less bureaucratic way. The Authority will also allow greater community and industry participation in drawing up the best management programs for running Commonwealth fisheries.

The board of the Authority will be expertise based — and will not be there to represent the interests of the fishing industry. Rather the interests of the industry will be represented by the management advisory committees, which will report to the board of the new Authority, and by the Fishing Industry Policy Council, which will report to the Minister.

Under the Government's public policy guidelines for statutory authorities, the Australian Fisheries Management Authority will be accountable to Parliament through the Minister, produce an annual report, be audited each year by the Auditor-General, and prepare a corporate plan and annual operating plans for the Minister's approval.

The Authority's operating budget will be met by the industry and the Commonwealth, the burden of cost to be in proportion to the benefits received. The management costs will include the cost of research which is specifically management related.

The new Authority will maintain strong links with the industry. It will have responsibility to establish and develop management advisory committees and devolve greater responsibilities to them if it judges this to be feasible and cost effective. However, it is the board of the Authority which will remain ultimately accountable for achieving its management objectives.

The Authority will forge close links with State Government fisheries agencies in recognition of the inter-relationship between Commonwealth and State fisheries.

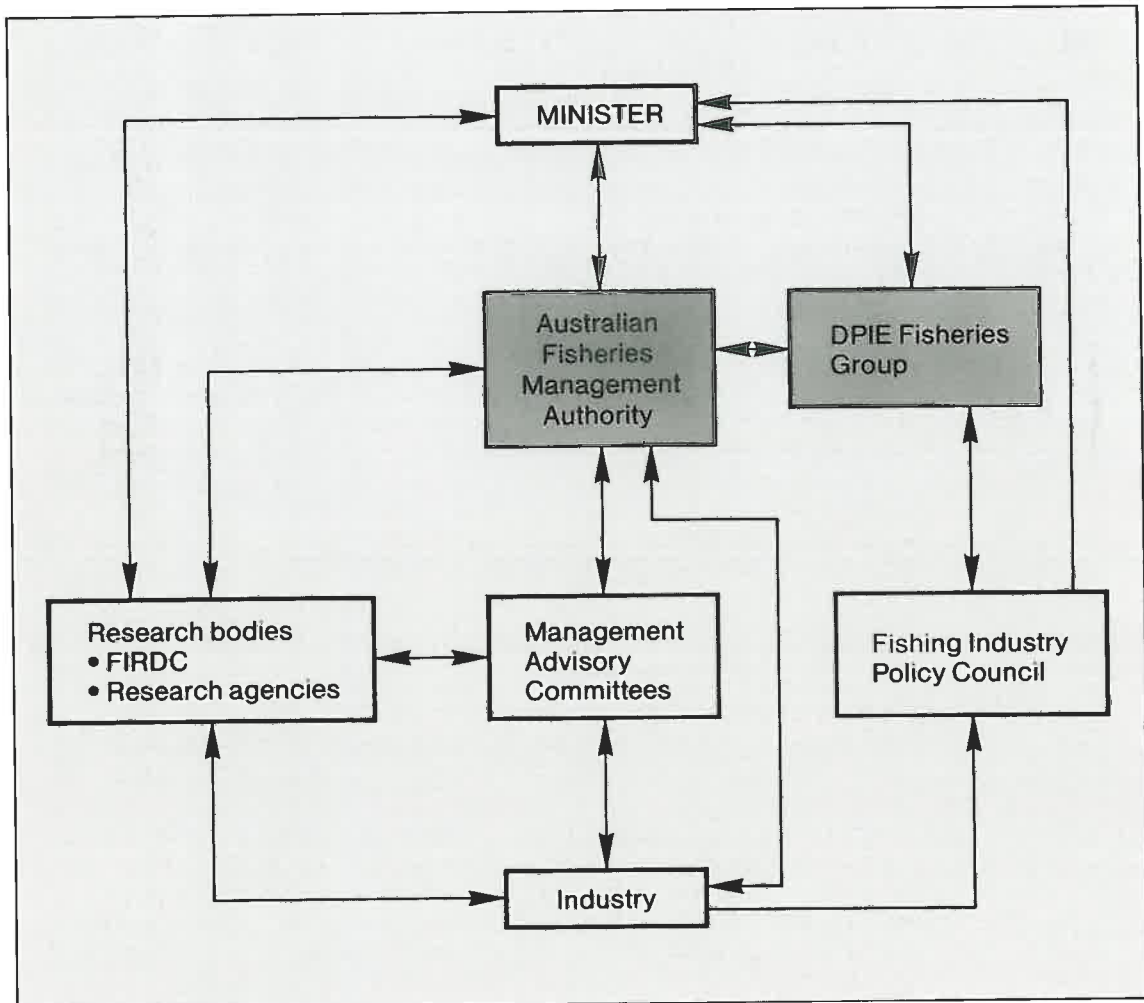
After five years the Industry Commission will review Commonwealth fisheries administration to assess whether any changes to these management arrangements are desirable.

Legislation to be reviewed

Consistent with the improvements to fisheries management outlined in this policy statement the legislation embodied in the *Fisheries Act 1952* will be completely reviewed. The aim is to provide a simpler and more effective legislative base for efficient fisheries management.

To fully integrate the new administrative arrangements with the management legislation, the Government intends to revise the full suite of fisheries legislation and present it to the Budget Sittings in 1990.

Figure 2
Principal elements of new Commonwealth fisheries management arrangements



Part I

New Policy Directions

1. Introduction

Since coming to power in 1983 the Government has committed itself to devising and implementing plans to manage Commonwealth fisheries effectively. While the Government has made much progress in recent years in protecting fish stocks and improving the long term viability of the fishing industry, it nevertheless recognises that further efforts are still needed.

This policy statement provides a comprehensive policy and administrative framework for the management of Commonwealth fisheries into the 1990s. It is based on the need for ecologically sustainable development of fisheries resources and it recognises the need to integrate development and environmental objectives to achieve efficient and effective natural resource management. This is the first comprehensive statement by any Commonwealth Government of its policies for those fisheries under its control.

1.1 Rationale for government involvement

Worldwide experience has shown that unregulated fisheries generally suffer from over-capitalisation and falling productivity and, with increasing frequency, face the threat of biological collapse.

These problems arise because of the lack of exclusive individual rights over the fish resources. The essence of the problem is that the actions of individual fishermen create costs for other fishermen. The result of behaviour which is economically rational at the individual level is unnecessary costs, excessive fishing effort and possible resource over-exploitation. At the industry level, the result is a loss of potential profit.

Hence, what manifests itself in fisheries as a biological problem occurs because of a failure to allocate all the costs of an individual's activities to that individual. In addition, Australia has the sovereign right to exploit, conserve and manage the fish resources of the Australian Fishing Zone. There is therefore a role for government to allocate access to fisheries resources in order to ensure that these resources are not over-exploited and that they are used as efficiently as possible to maximise benefits to the industry and the nation. Government also has the responsibility of ensuring that the level of exploitation is consistent with the likely demands of present and future generations of Australians. Fisheries management is therefore a challenging activity, made even more so by the complex biological systems which characterise fisheries resources.

Although Australia has valuable fisheries which make a vital contribution to the domestic economy and exports, the Australian Fishing Zone is not blessed with abundant stocks. It has more of the characteristics of a 'marine desert' than a 'marine goldmine'. As a result, the Australian industry responds rapidly to the discovery of new stocks, which places great demands on management. The industry needs policies to be developed to avoid problems of over-exploitation and inefficient allocation of resources which have typified many existing fisheries, and needs an adequate research effort to support management strategies.

The objectives to be pursued in the future management of Australia's fisheries need to be clear. In brief they are:

- to ensure the biological sustainability of the resource;
- to maximise the economic efficiency of resource use; and
- to ensure that private users of a community resource provide an appropriate return to the community for the right to exploit that resource for private gain.

If these objectives are met, a stable economic and biological environment will be established in which fishermen can pursue their commercial activities with greater confidence of a secure and viable future.

In the context of the Government's role in fisheries management the three objectives are not alternatives as sometimes suggested, but are *mutually reinforcing*. This is an important point when understanding and determining what policies are appropriate for fisheries management.

Until recently the immediate biological concerns have overshadowed the need for improved efficiency in managed fisheries. However, as just stressed, resource conservation and economic efficiency in fisheries management go hand in hand. An economically inefficient fishing industry characterised by over-capacity is also a potential threat to the biological survival of the resource. Both the biological *and* economic foundations of Australia's fisheries must therefore continue to be improved through the 1990s to ensure that a dynamic and efficient industry is developed.

While these objectives of management are clear and are achievable in all fisheries, the economic, biological and social environments differ between fisheries. Some fisheries are over-exploited and require substantial adjustment to reduce total fishing capacity and fishing effort, while others are in the early stages of commercial exploitation. Management regimes have to be adapted to meet the circumstances in each fishery, and so the methods used and the time required to achieve the management objectives will vary considerably from fishery to fishery.

Successful fisheries management requires an extensive base of scientific and economic information. However, fisheries research poses particular difficulties with respect to timing, cost and reliability. In May 1989 the Government announced important initiatives affecting scientific research and issued Ministerial statements on research. The policy statement *Research, Innovation and Competitiveness* discussed fisheries research in a general context. In this statement fisheries research is considered in more detail, with particular emphasis on the interaction needed between management and research.

The Government's recent environment policy statement *Our Country, Our Future* made clear commitments to assist the conservation of fish resources. Its proposal for an international moratorium on fishing southern bluefin tuna to allow stocks to recover, its decisions to severely restrict driftnet fishing in the Australian Fishing Zone and to press for a global ban on the use of this destructive practice, and its reference of coastal zone development issues to the Resource Assessment Commission

all indicate the considerable importance the Government places on conserving the marine environment.

Recreational fishing is an activity enjoyed by many Australians and it makes an important contribution to the economy. The Government recognises the significant impact recreational fishing can have in some fisheries and the need to consider this activity when making management decisions.

1.2 Scope of policy statement

This policy statement deals only with issues directly related to fisheries management. It does not specifically deal with fish marketing or post-harvest technology. These issues were the subject of a recent report *Casting the Net* by the Australian Science and Technology Council. The Government will be responding separately to the recommendations in that report.

The Government recognises that commercial fishermen as entrepreneurs aim to maximise profits. It also recognises the propensity for fisheries to attract excess investment, resulting in over-exploitation and reduced profitability. The Government's aim in managing fisheries is, therefore, to create conditions where the reasonable business aspirations of fishermen can be attained while safeguarding the fishery resource. Part I of this policy statement outlines the Government's strategies for achieving these goals, while Part II presents the revised administrative arrangements which support this approach.

The Government has identified a number of administrative objectives it believes should underpin future fisheries management arrangements. These include:

- cost efficient and effective administration;
- reduced Ministerial involvement in day-to-day decision making, while retaining ultimate Ministerial control;
- increased management flexibility;
- public accountability for decision making and expenditure; and
- increased involvement of the industry in fisheries management.

The revised administrative arrangements will provide a more appropriate administrative structure for managing Commonwealth fisheries in the 1990s and beyond. The relationships between managers, fishermen and researchers will be strengthened. Commonwealth fisheries administration will be more accountable as a result of cost recovery mechanisms, and will be more efficient and responsive to the needs of the community, the industry and government.

The Government firmly believes that adoption of the policies and new administrative arrangements outlined in this statement will lead to Commonwealth fisheries being managed on an economically sound, biologically sustainable basis. This will enable the Australian fishing industry to become more efficient and dynamic, thus ensuring its ongoing prosperity.

2. Basic Characteristics of the Australian Fishing Industry

Key facts

- Although Australia has the world's third largest fishing zone it ranks only about fiftieth as a fish producing nation. This is because of the low nutrient levels in waters surrounding Australia.
- Most of Australia's known fish resources are at or near full exploitation. Several have been over-exploited.
- The Australian fishing industry employs about 21 000 in the catching sector and a further 3600 in processing. These are mainly located in relatively small fishing ports spread around the coast.
- Australian fish production is dominated by high priced crustaceans and molluscs — rock lobster, prawns and abalone account for over 70 per cent of the total value of annual production of about \$800 million.
- Australia is a significant exporter of fisheries products. In 1988–89 exports were valued at \$564 million, compared with imports of \$413 million.

The Australian Fishing Zone covers an area of 8.94 million square kilometres, 16 per cent larger than the Australian land mass. This zone, which is shown in Figure 2.1, covers waters up to 200 nautical miles off continental Australia and Tasmania and also off the Cocos Islands, and Christmas, Heard, McDonald, Norfolk, Lord Howe and Macquarie Islands. While this is the third largest fishing zone in the world, Australia ranks only about fiftieth among the world's fish producing nations.

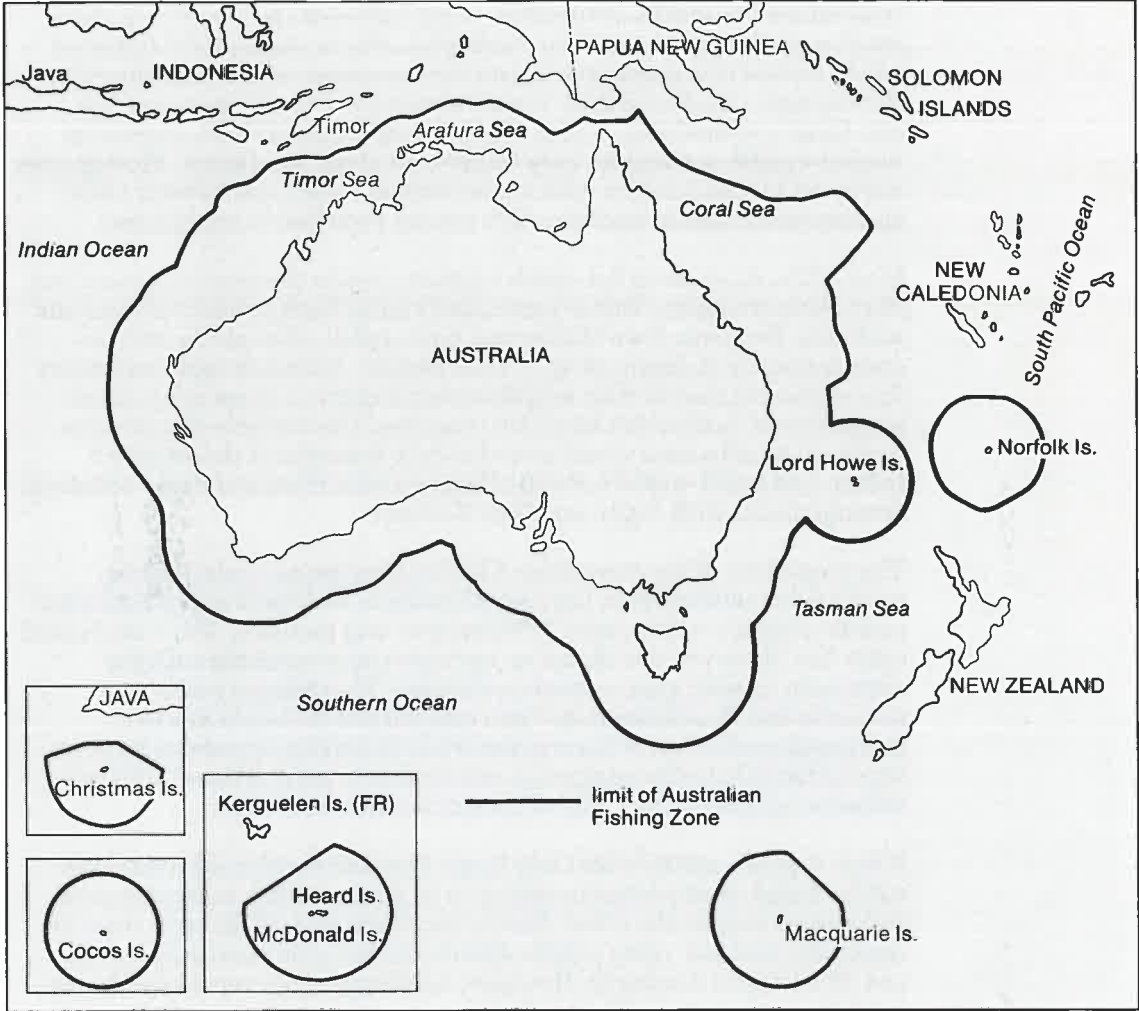
This poor performance reflects the low productivity of the oceans bordering the continent rather than the degree of exploitation of the nation's fish resources. As Table 2.1 shows, most of the known resources of any significance are considered to be at least fully exploited. Furthermore, the chances of discovering major new fish resources are not great.

2.1 Factors affecting fish production

The productivity of the oceans is determined by the availability of nutrients. The major fisheries of the world are all located where the supply of nutrients is high.

There are two major causes of regionally high nutrient levels. The first and most obvious cause is a major river system which carries nutrients from the terrestrial environment into the ocean — for example, the

Figure 2.1
The Australian Fishing Zone



Source: Australian Fisheries Service

Mississippi River carries nutrients into the Gulf of Mexico. The second and more important cause is currents raising nutrient rich waters to the surface where sunlight provides the energy for photosynthesis. The combined effect of nutrients and sunlight causes a virtual biological explosion which results in rich fisheries like those off the west coasts of South America and southern Africa.

Unfortunately the conditions for high nutrient levels are largely absent from waters around Australia. The lack of nutrients is not helped by the relatively restricted width of the continental shelf around much of the continent, particularly the southern half.

While these basic limitations dictate that Australia will never be a major fishing nation, it puts increased responsibility on us to carefully develop and manage the available fish resources.

2.2 Scientific and biological considerations

Australia's fish stocks are diverse; many different species each make a small contribution to the total catch. Fisheries or segments of fisheries which consist of a single species are the exception rather than the rule. For example, the South East Trawl fishery has over 60 species of fish, crustacea and molluscs. The seven most important of these species, by landed weight, account for only 60 per cent of the total catch. Most species are caught in association with one or several others; often lower value species are discarded and therefore are not recorded in production.

Most of the Australian fish catch is taken close to the coast in waters less than 50 metres deep. This is particularly so for high value crustacea and molluscs. However, trawl fishermen now exploit some stocks such as orange roughy at depths of up to 1500 metres. Although some migratory fish stocks are shared with neighbouring countries, these are a minor proportion of Australia's total fish resources. One notable exception is southern bluefin tuna which occurs widely throughout the southern Indian and south-western Pacific Oceans and is managed under trilateral arrangements with Japan and New Zealand.

The proportion of the Australian Fishing Zone being exploited has increased considerably in the past 25 years as Australians have adopted and developed a wide range of fishing gear and methods. The total landed catch has, however, not shown an increase commensurate with the expansion in area, gear and species landed. The discovery of new resources has done little more than compensate for losses due to decreased production of known resources. Australia appears to be at or beyond the maximum production achievable in most of its established fisheries, although the value of the catch continues to rise.

It also appears unlikely that any large, new and sustainable resources will be found. Best prospects appear to be demersal fish in waters over 200 metres deep in the Great Australian Bight and off the west coast of Australia, and low value pelagic species in the Great Australian Bight and off northern Australia. However, neither group is considered likely to yield large, sustainable production.

While harvesting reduces fish stocks, environmental impacts on habitat also reduce stock levels. These impacts include water pollution, coastal zone development and siltation of fragile reef and seagrass areas through land clearing.

The stock levels of many fish species are governed by a range of poorly understood physio-chemical and biological factors, which cause variations in the distribution of stocks with respect to both area and time. Some stocks vary more than others. Factors influencing these variations include food supplies, breeding success and migrations.

While there is a store of scientific knowledge on stocks in the more established fisheries, the long lead times for research results means that there is little information on newly discovered resources. Since the fishing industry responds rapidly to the discovery of new fisheries, stocks may be virtually unexploited one year and be over-exploited just a few years later.

Table 2.1: Status of major fisheries in the Australian Fishing Zone in 1989

Fishery	Location	Operator	Knowledge of stock	Exploitation Level
Northern prawn	N	Domestic	Adequate	Fully exploited
Other prawn	N,S,E,W	Domestic	Adequate	Fully exploited to slightly overexploited
Torres Strait prawns	N	Domestic	Adequate	Fully exploited
Rock lobster	W,S,SE,TS	Domestic	Adequate	Fully exploited
Scallops	NE,W,S	Domestic	Adequate	Dangerously overexploited
Abalone	S,SE,SW	Domestic	Adequate	Some stocks overexploited
Southern shark	SE	Domestic	Adequate	Overexploited
Southern bluefin tuna	S	Domestic; foreign	Good	Dangerously overexploited, commercial viability threatened
East coast tuna	E,NE	Domestic; foreign and recreational	Inadequate but improving	Nearing full exploitation
Jack mackerel	S,SE	Domestic	Inadequate	Uncertain, probably fully exploited
Great Australian Bight demersal fisheries	S	Domestic	Inadequate	Exploitation low overall but increasing with development
South east trawl, shelf and slope component	SE	Domestic	Adequate for some major species	Some stocks overexploited
Orange Roughy	S	Domestic	Inadequate	Unknown, but present catch levels probably not sustainable
Gemfish	S,SE	Domestic	Good	Eastern stock over-exploited
Western and north-western deepwater	NW,W	Domestic	Inadequate; one of least explored parts of the Australian Fishing Zone	Probably fully exploited in parts of NW deepwater crustacean fishery; resources unknown elsewhere
Northern and north-west shelf demersal	N,NW	Foreign and domestic	Adequate	Northwest shelf over exploited, and others fully exploited
East coast seamounts	E	Domestic	Inadequate	Little known; probably unable to support large fishery

Source: Bureau of Rural Resources.

2.3 Economic and social considerations

The Australian fishing industry, which is based on 12 major and over 80 lesser fisheries, had an estimated landings value in 1988–89 of \$788 million. This is 5 per cent less than the value of the record landings in the previous year but is still the second highest value recorded. Fisheries production ranks fifth in value after wool, beef, wheat and milk, but ahead of sheep meat, poultry meat and sugar.

Total Australian landings of fish for human consumption has, over the past six years, fluctuated between 151 kt and 157 kt a year. Landings are dominated by high unit valued species — prawns, rock lobster and abalone — which in 1988–89 made up 72 per cent of the value but only 28 per cent of the quantity landed (see Figure 2.2).

Over the past few years there has been a shift in Australian fishing operations, with deepwater trawling for finfish and crustaceans assuming increasing importance. In 1983–84 finfish made up 38 per cent of the weight of landings and 17 per cent of the value of the catch but by 1988–89 finfish accounted for 60 per cent of the weight and 20 per cent of the total value of landings. Three factors have been important in the increase in deepwater trawling: the fall in the relative value of the Australian dollar, which made imports more expensive and raised the value of the Australian catch; developments in fishing technology which have made fishing at lower depths feasible; and the increased interest in deepwater trawling brought about by New Zealand's success in exploiting orange roughy.

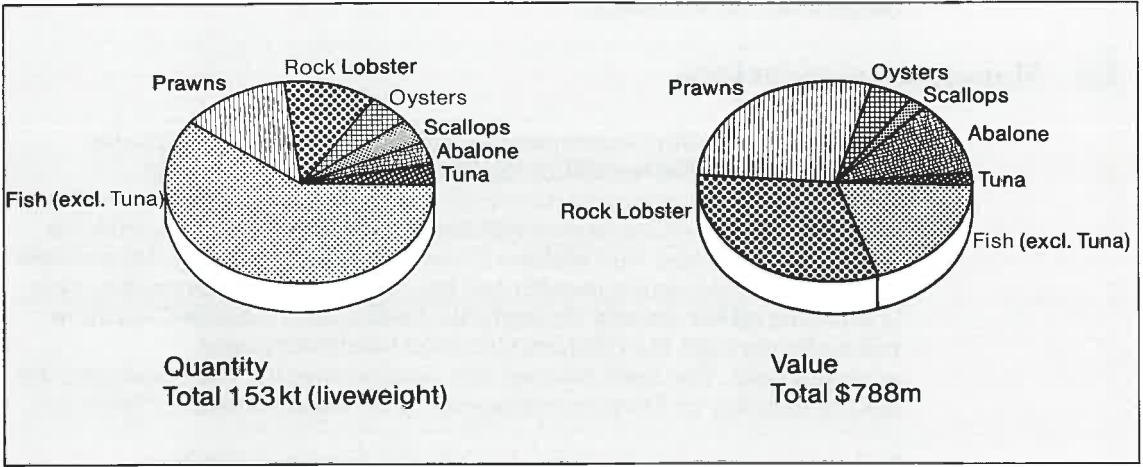
The Australian Bureau of Statistics has reported that in 1986, 21 000 people were employed directly in the catching sector of the fishing industry and a further 3600 were employed in the processing sector. Because Australian fisheries can be exploited using relatively small boats with a limited range, the fishing industry is not concentrated in one region or area but is dispersed around the Australian coast.

Compared with the size and technological sophistication of the catching sector of the Australian fishing industry the fish processing sector is small with few large-scale plants. The reasons for this include the high proportion of catch made up of high value species, which attract their highest price when sold with a minimum of processing; the relatively large size of the Australian fresh fish market compared with landings of finfish; the wide dispersion of fisheries; the considerable variability in landings; the large variety of fish species; and the seasonality of landings.

2.4 Marketing considerations

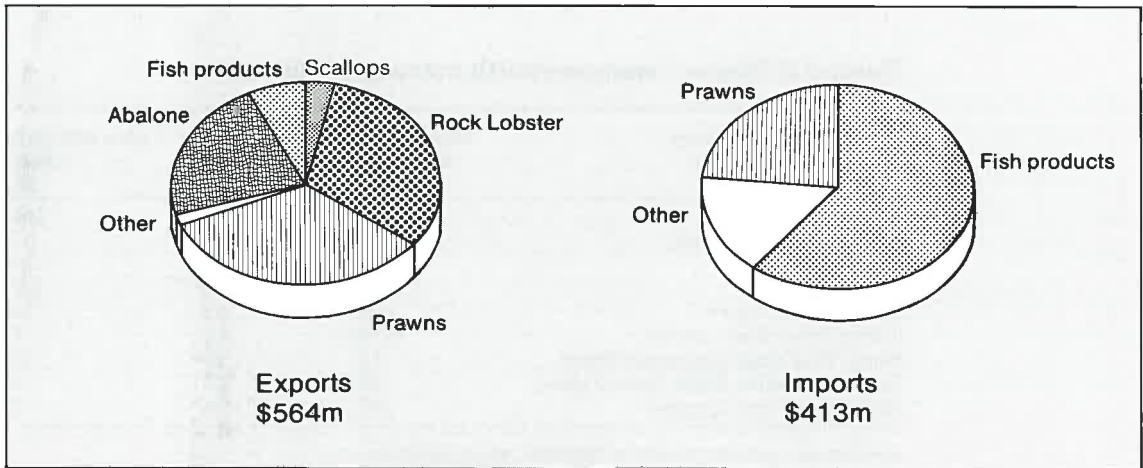
Australian fishermen are mostly price takers, with the prices being determined by overseas markets and shifts in the relative value of the Australian dollar. From 1983–84 to 1988–89 the value of Australian exports of fisheries products increased from \$393 million to \$564 million, while the value of imports increased from \$260 million to \$413 million. The composition of exports and imports of fisheries products in 1988–89 is shown in Figure 2.3. Although landings have increased and the composition of these landings has changed, an important reason for the recent increase in the total value of exports has been the fall in value of the Australian dollar against the Japanese yen and the US dollar.

Figure 2.2
Quantity and value of Australian production of major fisheries products 1988-89



Source: Australian Bureau of Agricultural and Resource Economics

Figure 2.3
Value of Australia's import and export of major fisheries products 1988-89



Source: Australian Bureau of Agricultural and Resource Economics

About 90 per cent of exports are made up of high value prawn, rock lobster and abalone, most of which is destined for Japan and the USA. Conversely, about 60 per cent of Australian imports are made up of a wide variety of finfish products from a number of sources, the most important being New Zealand, Thailand, Malaysia, Canada, the USA and the Republic of Korea.

As most Australian fisheries are fully exploited, any substantial increase in returns to fishermen can come about only through increased catches following recovery of over-exploited stocks; price rises resulting from increased demand; a further decrease in the relative value of the Australian dollar; and improvements in the quality of marketed fresh fish and in the processing and packaging of fish so as to meet the needs of specialist markets. Any increase in the relative value of the Australian dollar will result in a decrease in the prices received by fishermen. In

addition, the increased world supplies, particularly of high value species such as prawns, from the aquaculture industry will result in greater price competition for wild stocks.

2.5 Management structure

The Commonwealth Government and the States are responsible for administering fisheries within the Australian Fishing Zone in accordance with traditional jurisdictional arrangements (States to three nautical miles and Commonwealth from three to 200 nautical miles) or arrangements under the Offshore Constitutional Settlement. When there is a need for the Commonwealth and the States to coordinate policy, this is achieved either directly through the Australian Fisheries Council or indirectly through the Offshore Constitutional Settlement arrangements. The links between the Commonwealth, the States and the fishing industry in fisheries management are summarised in Figure 2.4.

Fisheries management policies must be implemented within a framework determined by the legislative responsibilities of the Commonwealth and the States, and Australia's international responsibilities. The major fisheries in which the Commonwealth exercises direct management responsibility are shown in Table 2.2.

Table 2.2: Major Commonwealth managed fisheries

Fishery (a)	Number of boats (b)	Gross Catch (1988) kt	Value of Catch (1988) \$m
Northern Prawn	226	7.9	135
Southern Bluefin Tuna	77	11.3	45
South East Trawl	142	25.0	40
Southern Shark	200	6.0	20
Torres Strait Prawn	150	1.2	16
Torres Strait Rock Lobster	170 (c)	0.2	5
North West Shelf Deepwater Trawl	12	1.0	13
Great Australian Bight Trawl Fishery	10 (d)	3.7	8
East Coast Tuna Longline	196	0.6	5

(a) Does not include industrial fisheries, or aquaculture.

(b) Some boats are endorsed to operate in more than one fishery.

(c) Does not include 200 community vessels for which licences are not required.

(d) Active fishermen.

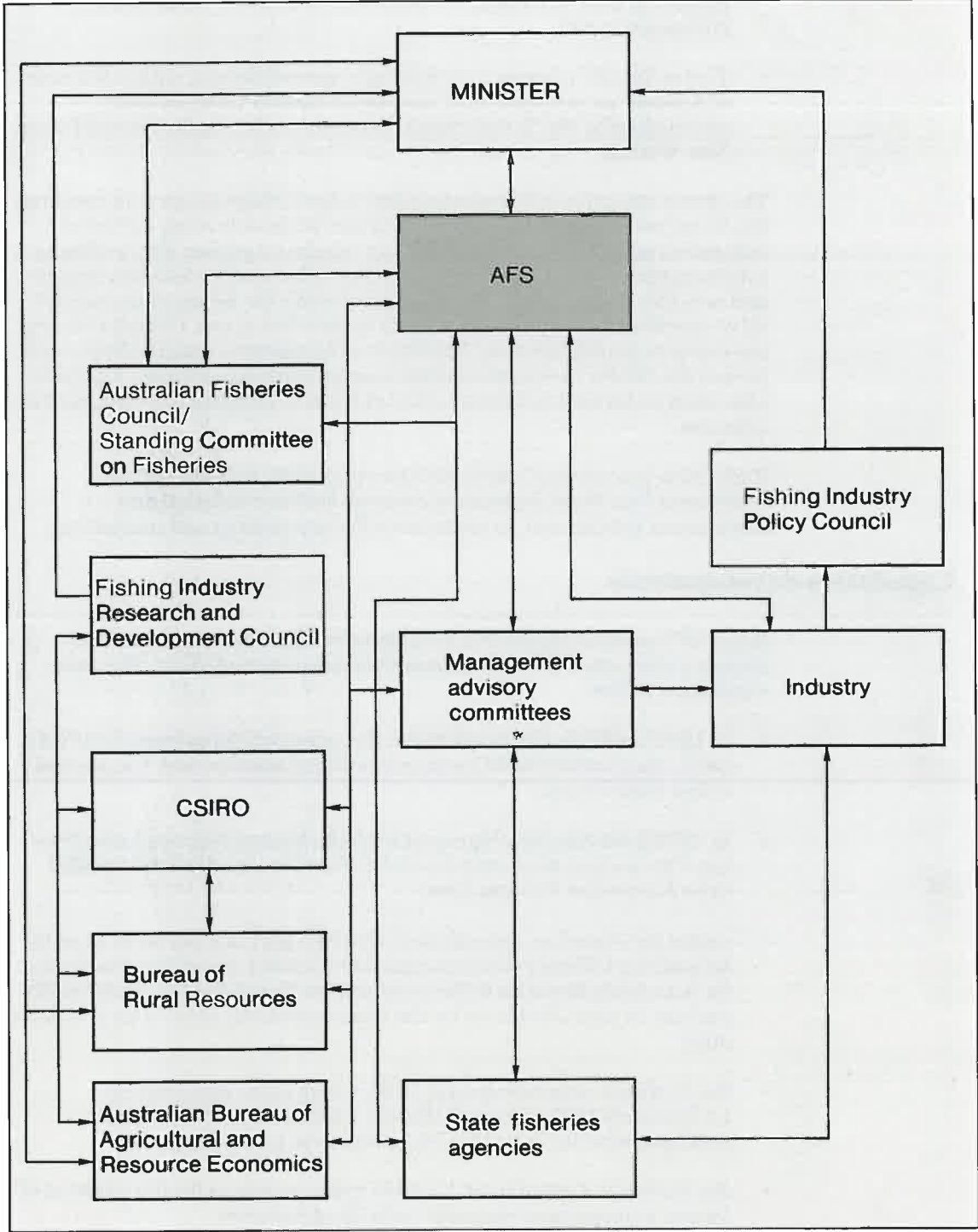
Source: Australian Fisheries Service.

Commonwealth and State legislative responsibilities

The Commonwealth, by use of its constitutional powers contained in s51(x) (fisheries in Australian waters beyond territorial limits) and s51(xxix) (external affairs), has legislated to regulate commercial fishing activities in waters beyond the Territorial Sea (3 nautical miles from shore) through the following Acts:

- *Fisheries Act 1952* regulates commercial fishing for swimming organisms other than whales in the area of proclaimed waters in the Australian Fishing Zone (3 to 200 nautical miles from shore);

Figure 2.4
 Organisational links in Commonwealth fisheries management in December 1989



- *Continental Shelf (Living Natural Resources) Act 1968* regulates the taking of sedentary organisms from the seabed of the Continental Shelf (the area beyond the Territorial Sea out to a water depth of 200 metres); and
- *Torres Strait Fisheries Act 1984* regulates all fishing within the area of Australian jurisdiction of the Torres Strait Protected Zone established by the Torres Strait Treaty between Australia and Papua New Guinea.

The stated objective of Commonwealth fisheries legislation is to conserve the living resources from over-exploitation while achieving optimum utilisation of those resources. Each Act requires a person who wishes to take organisms from Commonwealth controlled waters to hold a licence and provides power for the Minister responsible for fisheries to prohibit all or specified fishing activities in all or specified areas. Complementing the power to prohibit fishing activities is the power to endorse licences to permit the holder to engage in otherwise prohibited activities. The Acts also allow conditions relating to the taking of organisms to be imposed on a licence.

Each State has enacted legislation for regulating fisheries in the Territorial Sea. State legislation controls both recreational and commercial fishing and, in some cases, fish processing and marketing.

Legislative developments

Since 1975 several legislative developments have had a substantial impact on the scope of Commonwealth fisheries jurisdiction. The most significant follow:

- in 1975 the High Court validated the *Seas and Submerged Lands Act 1973*, which confirmed Commonwealth jurisdiction over the sea bed to low water mark;
- in 1979 following developments with the United Nations Law of the Sea Convention the Commonwealth Government declared the 200 mile Australian Fishing Zone;
- under the *Fisheries Amendment Act 1980*, part of a parcel of 14 Acts termed the Offshore Constitutional Settlement, provision was made for managing fisheries under joint authorities of the Commonwealth and one or more States, or by the Commonwealth only, or by one State only;
- the *Fisheries Amendment Act 1980*, which came into force on 14 February 1983, allowed Offshore Constitutional Settlement arrangements for individual fisheries to be put in place; and
- the *Fisheries Amendment Act 1985* made provision for the gazettal of formal management plans for individual fisheries.

International responsibilities

Australia's jurisdiction over the Australian Fishing Zone was established in 1979, following the Third Law of the Sea Conference and the 1979 proclamation by the International Court concerning the validity of extended economic zones.

International law allows a nation to regulate the fishing activities of its nationals anywhere in the world and gives a coastal nation sovereign rights over all fishing activity within its 200 nautical mile fishing zone. The nation is responsible for conserving the living resources in this zone and for promoting the optimum use of those resources, which gives rise to an obligation to allow foreign fishermen to take that part of the total allowable catch which that country's fishermen are unwilling or unable to take.

Australia has granted foreign fishing boats access to its fishing zone through bilateral agreements (for example the Australia-Japan tuna agreements), which allow foreign vessels conditional access to fish in the zone, and through agreements which allow Australians to enter into cooperative fishing ventures with foreign interests using foreign fishing boats.

The Offshore Constitutional Settlement

The Offshore Constitutional Settlement (OCS), progressively implemented by the Government since 1983, was designed to provide a more effective management structure for Australian fisheries and to remove some of the complexities that arose because of divided Commonwealth and State jurisdiction. The aim was to have individual fisheries managed under a single law, Commonwealth or State and to reduce the number of licences each fisherman would have to hold, resulting in more cost efficient fishery management.

The OCS made provision for four management categories:

1. Joint authority management. The Commonwealth and one or more States can form a single legal entity which manages a fishery or fisheries under a single law, either Commonwealth or State. The *Fisheries Amendment Act 1980* made provision for four joint authorities and the capacity to create more as the need arose.
2. State management. Where a fishery is located off only one State, arrangements can be made to manage that fishery under State law. As a result, fishermen operating in only that fishery no longer require a Commonwealth Fishing Boat Licence.
3. Commonwealth management. Where a fishery is adjacent to more than one State the fishery can, by agreement between all parties, be managed solely by the Commonwealth. In such cases fishermen need to hold only a Commonwealth Fishing Boat Licence.
4. *Status quo* management. In fisheries where no OCS management arrangements can be agreed, *status quo* arrangements with State control over coastal waters (under 3 nautical miles from shore) and

Commonwealth control over proclaimed waters (3 to 200 nautical miles from shore) apply. Fishermen need to hold all necessary Commonwealth and State licences to operate in such fisheries.

To date OCS arrangements have been negotiated between the Commonwealth and all States except New South Wales, where negotiations are still proceeding.

Administration

Fisheries under the Commonwealth's control are presently administered by the Australian Fisheries Service, a division of the Department of Primary Industries and Energy. The Department also has two research bureaux which are involved with fisheries related research. The Bureau of Rural Resources provides scientific advice on fisheries to the Australian Fisheries Service and the Minister, while the Australian Bureau of Agricultural and Resource Economics provides economic advice.

Since 1986 the Australian Fisheries Service has administered fisheries using management teams, each dealing with a single fishery or group of fisheries and grouped into two branches. A third branch deals with policy development, international issues and planning.

When developing and administering fisheries policies the Australian Fisheries Service has well developed avenues for consulting with the industry. At the individual fishery level, there are management advisory committees which comprise representatives of the Australian Fisheries Service, State Governments, the industry and in some cases CSIRO. In general these committees have been quite successful and are playing an important part in the management of major fisheries. The Australian Fisheries Service also has regular contact with the peak industry body, the National Fishing Industry Council, and other industry organisations, commercial organisations and individual fishermen. These administrative arrangements were shown in Figure 2.4.

3. Fundamental Principles of Fisheries Management

Key principles and management methods

- Fisheries are renewable biological resources which, if properly managed, can provide a continuing flow of product and income for an indefinite period.
- An understanding of the size, distribution and population dynamics of the species exploited is essential for effective management of any fishery.
- Because of the difficulty in allocating appropriate individual rights to the resources, fisheries tend to attract excessive investment which results in excessive fishing capacity, resource over-exploitation and poor economic performance.
- Because over-capitalisation and over-exploitation result from the failure of the market to give correct signals to investors, self-management of fisheries by participants is not appropriate and governments must become directly involved.
- As fisheries resources belong to the community it is appropriate for those given the right to exploit the resources for private commercial profit to pay an appropriate amount to the community for that privilege.
- The Government believes that because individual transferable quotas are a management tool which allows autonomous adjustment of fishing fleets these should be the preferred management control.
- Where individual transferable quotas are used the Government considers that the allocations should be proportions of a total allowable catch rather than absolute quantities.
- In fisheries where management through individual transferable quotas is less cost effective than some other form of management, the management controls must contain some mechanism for removing excess capacity.
- The Government will formally recognise the ongoing nature of fishing rights in existing developed fisheries.
- The Government proposes to establish a formal register of fishing rights so as to improve the documentation available to fishermen seeking to use those rights as security.

Worldwide experience has demonstrated that unregulated fishing generally results in two problems:

- over-fishing, which reduces future fish production and which, if allowed to continue, reduces fish stocks to levels from which recovery is not possible; and
- over-capitalisation (significantly more capital and labour employed in harvesting fish stocks than are needed to do so efficiently), which wastes valuable resources.

The problems occur because of the lack of appropriate property rights to fisheries resources. This leads to economically inefficient exploitation. Unless action is taken, fisheries invariably become over-capitalised and, with increasing frequency, are biologically over-exploited.

To secure the long term viability of commercial fisheries management controls are needed. The objectives of these controls should be:

- to ensure the biological sustainability of the resource — that is, to ensure that current exploitation of the resource and human activities affecting the environment which sustains the resource do not endanger the future productivity of the resource;
- to maximise economic efficiency in the exploitation of the resource; and
- to ensure that the community receives an appropriate return from individual fishermen exploiting a community resource for private gain.

This chapter establishes a framework for understanding the processes involved in the exploitation of fisheries. It deals separately with the biological and economic aspects of fisheries, which effective management addresses simultaneously, considers alternative management measures and then examines the case for levying a charge on the fishing industry in return for the right to exploit a public resource.

3.1 Biological aspects

Fishing exploits renewable biological resources. These resources are subject to various environmental influences which may affect their size and distribution quite independently of fishing activity. These environmental influences also vary from year to year.

The biomass (total quantity) of an unexploited fish stock is normally close to its maximum, with environmental factors such as food availability, habitat and interaction with other species, including natural predation, setting a limit to further growth. While the biomass varies between years, natural mortality generally equals natural increase.

Figure 3.1(a) shows the theoretical long term relationship between fishing effort and the biomass of a fish stock. Each point on the biomass curve represents the average size of the biomass that would exist if fishing effort was held constant for a reasonable period. In other words each point on the curve is an equilibrium point where the growth of the biomass equals the yield from the fishing effort. The biomass curve ignores changes that would occur because of environmental fluctuations.

The growth of the biomass is determined by two factors — one is the carrying capacity of the environment, the second is the reproductive capacity of the parental stock. Low levels of fishing effort on a previously unexploited biomass will not have a substantial impact on the total biomass because the reproductive capacity of the still large parental stock will be mainly constrained by the environmental carrying capacity and will be little affected by fishing effort.

Figure 3.1(a)
Long term relationship between biomass and fishing effort

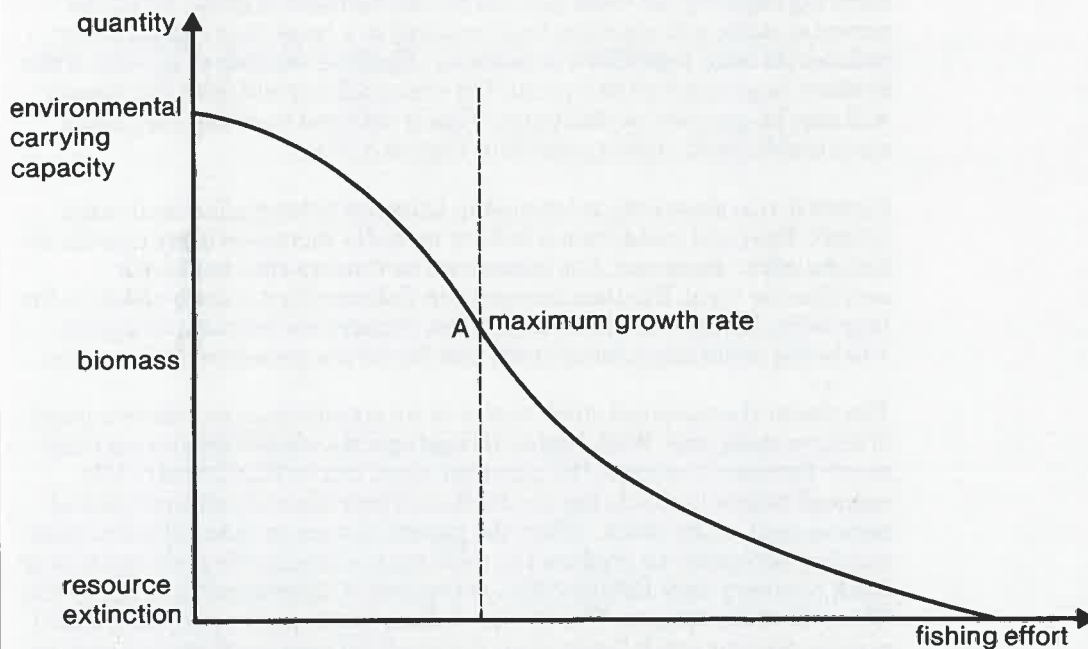
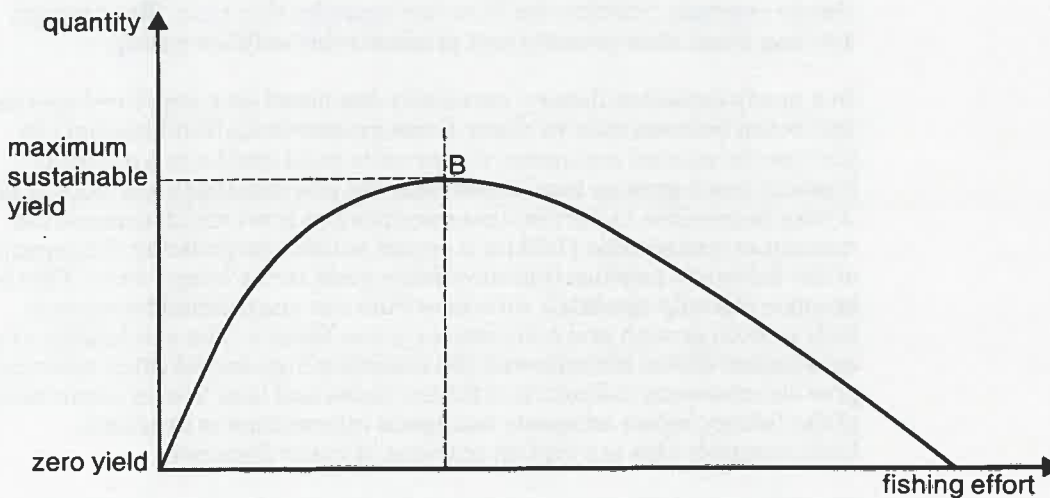


Figure 3.1(b)
Long term relationship between yield and fishing effort



As the biomass is reduced by fishing effort the reproductive capacity of the parental stock becomes more important in determining the growth of the biomass than the environmental carrying capacity. At very low levels of biomass resulting from high levels of fishing effort, the environmental carrying capacity has virtually no limiting effect on the growth of the biomass, its size being determined almost totally by the size of the parental stock.

Between these extremes there is a point at which the rate of growth of the biomass is greatest. At this point the biomass will have been reduced to a level (point A in Figure 3.1(a)) which is well below the environmental carrying capacity, so there is room for the biomass to grow, while the parental stock will not have been reduced to a level that significantly reduces its total reproductive capacity. Because the rate of growth of the biomass is greatest at this point, the sustainable yield from the fishery will also be greatest at this point. This is referred to as the maximum sustainable yield, and is point B in Figure 3.1(b).

Figure 3.1(b) shows the relationship between fishing effort and catch (yield). The total yield from a fishery initially increases quite rapidly as fishing effort increases, but then slows as it nears the maximum sustainable yield. Further increases in fishing effort reduce yields in the long term, because the increased effort reduces the biomass to a point where the reduced parental stock size limits the growth of the biomass.

The size of the parental stock varies in its significance as a determinant of future stock size. With highly fecund species whose females each lay many thousands of eggs, the parental stock can be fairly drastically reduced before it affects the production of juveniles which survive and become part of the stock. When the parental stock is reduced below that number necessary to produce the maximum sustainable yield the rate of stock recovery once fishing effort is reduced is determined largely by the life cycle of the species. The stocks of short lived species such as tropical prawns recover much faster than the stocks of long lived species such as shark.

Fisheries which face the greatest danger of depletion from over-fishing are those based on species with low reproduction rates. Whales are the classic example. Sharks also have low reproduction rates. Both groups are long lived, slow growing and produce relatively few young.

In a newly exploited fishery, especially one based on a long lived species, the initial biomass may be many times greater than that necessary to provide the annual maximum sustainable yield and have a parental biomass much greater than is necessary to produce that yield. As a result it may be possible to harvest this resource at a level which exceeds the maximum sustainable yield for a period without prejudicing the capacity of the fishery to produce that maximum yield in the longer term. This is because initially the catch will come from the unexploited biomass as well as from growth and recruitment to the fishery. The availability of a substantial initial biomass and the resulting high initial catch rates can give an erroneous indication of future yields and lead to over-exploitation of the fishery before adequate biological information is available. Unfortunately this is a typical outcome in many fisheries.

The fisheries yield curve used here is a theoretical concept explaining what would occur if fishing were the only non-biological factor

influencing a fish stock, if all environmental factors remained constant over time and if all biological factors influencing the behaviour of the stock could be represented by a single measure, the biomass. Many of the factors which are ignored in the model, such as age class composition and environmental fluctuations, are highly relevant to the yield from the stock. In reality the catches taken with a given amount of fishing effort fluctuate considerably from year to year in response to environmental factors that affect the size of the resource and/or behaviour and therefore the catchability of the fish. This means that the maximum level of catch that can be taken without affecting the catches in future years can be expected to vary considerably.

There are a number of factors that can contribute to seasonal variation in the catch, some related to the size of the fish stock, some to environmental conditions and some to the behaviour of the fish. In general the potential catch from long lived species is more predictable than that from short lived species. This does not mean that wide fluctuations do not occur between year classes of long lived species, but as each year class is in the commercial fishery for several years, changes in the overall stock size tend to be gradual rather than abrupt.

3.2 Economic aspects

From a national viewpoint fishery resources should be exploited in an economically efficient manner. When measuring the contribution the fishing industry makes to the national economy, the efficiency with which it uses marine resources, capital and labour and the amount of total profits it generates must be taken into account, not just its contribution to export income and import substitution.

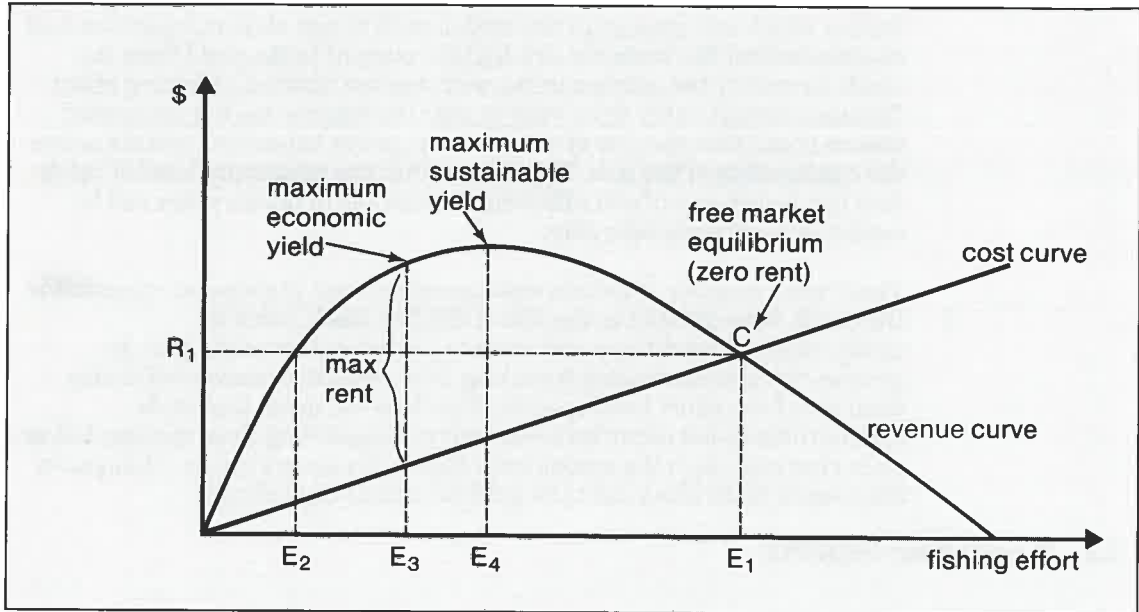
In the absence of government intervention a free market will not allocate resources to fishing activities in an efficient manner.

Figure 3.2 shows simplified long run cost and revenue curves for commercial fishing. If fish prices are assumed to be constant, revenue is related to the size of the catch and so the revenue curve is the same shape as the yield curve in Figure 3.1(b). Initially each additional unit of fishing effort increases the total catch and revenue, but because the size of the fish stock is being reduced the extra catch (and hence extra revenue) taken by each additional unit of effort will progressively decrease. This occurs because increased fishing effort affects the whole fishery — total fish stocks are reduced, and as a result the catch per unit of effort is reduced.

There will be a point where an additional unit of effort will not increase the total catch or revenue any further. This is the point of maximum sustainable yield. At still higher levels of effort there will be reduced total catch and revenue.

In Figure 3.2 fishing costs are assumed to be constant for each unit of fishing effort, so the cost curve is a straight line. Costs include the payments that fishermen make for wages and materials, an allowance for depreciation, and normal returns to capital. Thus costs in this sense include an allowance for what is usually termed profit. Unless fishermen can meet all costs, including a profit on investment that is at least commensurate with what could be earned elsewhere, their businesses, like any other, will eventually fail.

Figure 3.2
Long run revenue and cost curves for a fishery



The difference between the revenue and cost curves represents excess profit or rent. When rent results from the intrinsic wealth-generating capacity of a natural resource it is referred to as resource rent (see the box titled 'The nature of rent').

If a fisherman had exclusive use of a fishery, the fisherman would use a level of effort to harvest the resource which maximised the excess profits. This is effort level E_3 in Figure 3.2. This level of effort generates the maximum resource rent (also called maximum economic yield). At this level of effort the revenue from the catch exceeds the cost of fishing by the greatest amount, and economic efficiency is maximised. Figure 3.2 shows that the level of fishing effort necessary to maximise economic efficiency is less than that required to take the maximum sustainable yield, E_4 , so exploitation at this level will not result in biological over-exploitation.

This can be contrasted with a situation in which all fishermen have free access to a fishery. In this case if fishermen are making excess profits others will enter the fishery and seek a share of those profits for themselves. Existing fishermen will also expand their capacity to increase their share of the profits.

As the increased fishing effort reduces the size of the biomass, the available excess profits will fall. Nevertheless, while some excess profits remain there will still be an incentive to increase effort further, and this incentive will continue until there are no further excess profits to be captured (point C in Figure 3.2).

Thus where there is open access to a fishery, market signals result in a level of effort of E_1 . This is not an efficient level of fishing effort. Effort of E_1 yields revenue of R_1 ; however, this same revenue and the same size of harvest could be achieved with a much lower level of effort, E_2 . Clearly, economic resources (capital and labour) are being wasted if effort of E_1 is

used. It is obvious that in this situation a free market fails to efficiently allocate economic resources (termed market failure).

The analysis becomes more complicated when the effects of time discounting through interest rates are taken into account. When this is done it may be found that for some fish resources, particularly those with low growth rates and low sustainable yields, the highest economic yield may be obtained by treating the fish population as a non-renewable rather than a renewable resource and 'mining' it rather than 'conserving' it. These circumstances are unlikely to occur often. Clearly adopting a mining strategy would not be consistent with the Government's environmental objective of conserving the resource.

From the above discussion it can be seen that what manifests itself in fisheries as a biological problem of over-exploitation is attributable to an inefficient allocation of economic resources which occurs because of the absence of exclusive individual rights. (Some management measures do provide partially effective individual rights, and this is discussed in the next section.) It is therefore appropriate for governments to intervene with measures which control the activities of fishermen to prevent over-exploitation and dissipation of potential resource rent. Ideally these controls should recognise the desire of individuals to maximise profits, and should harness this desire in such a way that efficiency is not impaired.

The nature of rent

If the full costs of exploiting a natural resource (the cost of labour, capital including depreciation, materials and an allowance for profit) are subtracted from the returns from selling the output of the resource, then any remaining surplus is termed a rent. These rents can arise from the technical skills of the operators, entrepreneurship, short term under-supply of some inputs and, most importantly because natural resources have a value that is not the product of any manmade effort. That portion of rent attributable to the value of natural resources is termed resource rent.

Resource rent is valuable, but as the discussion in section 3.2 shows, it can easily be lost. In open access fisheries the rent is lost because the market allocates too many economic resources (labour and capital) to fishing, an instance of market failure. When markets fail in this manner, governments need to become involved to ensure that economic efficiency is maximised and the rent is not lost.

It is possible for governments to artificially create rents. For example, if a government was to limit the number of hotel beds to less than demand in a particular city, then those supplying the beds would receive some rent. In this situation rent arises because an artificial shortage of hotel beds has been generated, causing their price to rise above the costs of supplying them. Such government action, however, while providing gains to producers, results in a loss to consumers and a reduction in economic efficiency.

Government intervention is required in the case of open access fisheries to ensure that economic resources are efficiently used. If a government was to artificially create rents by intervening when there is no market failure its intervention would distort an otherwise efficient allocation of economic resources.

3.3 Alternative management measures

Many attempts to manage fisheries, usually by restricting inputs to fishing, have been directed solely at addressing the biological aspects of over-exploitation. These attempts have tended to reduce the efficiency with which fishermen operate and provide only temporary respite because increasing fish prices, new technology and the substitution of unrestricted inputs for restricted ones have resulted in continued expansion in fishing effort and the need for more restrictions.

In fisheries where sufficient biological information is available, an aggregate quota or total allowable catch has often been set, with the fishery being closed when this quantity has been taken. While quotas have proved effective from a biological viewpoint, their use has been characterised by a 'rush to fish' as individual fishermen have sought to maximise their share of the allowable catch. This has frequently led to shorter fishing seasons, market dislocations as supplies became peaked, and high policing costs.

Since the early 1950s, as the economic theory outlined in section 3.2 has been developed (explaining that biological over-fishing occurs because of economic pressures related to resource rent dissipation and over-capitalisation) there has been a shift away from a purely biological emphasis in management to approaches which attempt to solve both the economic and biological problems.

If attempting to maximise economic efficiency, removing excess fishing capacity becomes a central part of management. In an over-exploited fishery, management must also facilitate stock recovery by restraining fishing effort to a level necessary to permit stock recovery. When both these management objectives have been achieved, the restructured fishery must be managed so as to prevent the problems from recurring.

Input controls

The most frequently used method of addressing the problems of over-fishing and over-capitalisation has been input control, most often involving limits on the number of boats that can operate in a fishery.

However, restrictions on boat numbers alone do not control fishing capacity, as fishermen can substitute larger or faster boats, and/or use more fishing gear. To be effective, limited entry has to be supported by supplementary controls to contain the fishing power of the fleet — for example, gear restrictions and boat replacement controls.

Most existing limited entry schemes were introduced into fisheries that already had substantial over-capacity. Despite this, few such schemes have contained provisions to reduce over-capacity or the ongoing increases in fishing capacity that result from technological innovations. However, the resource rent generating capacity of some fisheries managed through input controls has still been sufficient to generate rents which have become capitalised into very high market values for fishing rights.

The Government believes that the prime method for controlling fishing capacity through input controls should be tradable units for gear or some

close proxy for gear. Market forces should be allowed to determine the distribution of regulated inputs among fishermen. If this is done a fisherman wishing to expand fishing capacity can buy regulated inputs from other fishermen. This results in some adjustment to the structure of the fishing fleet.

Output controls

Aggregate quotas or total allowable catches have been used to provide biological protection of fisheries. Once the annual quotas have been taken the fisheries are closed. This strategy does nothing to prevent resource rent dissipation — the incentive for each fisherman to take as much of the catch as possible remains — and as a result fisheries managed in this way have been characterised by increased capitalisation in boats and ever shorter fishing seasons.

However, by setting an aggregate quota and allocating it to fishermen as individual transferable quotas (ITQs), rights over a proportion of the catch are established. Market forces distribute the quota among those fishermen who value the rights most highly and are able to use the resource most efficiently. Because quota holders are guaranteed a proportion of the catch, they no longer need to compete for their catch and can concentrate on using the most economically efficient means of taking their share. In this way, ITQs facilitate autonomous adjustment of fleet size and fishing operations.

The value of quota units to fishermen is determined by how efficiently each can use them. In general the more efficient fishermen buy ITQs from the less efficient at prices that exceed the earning capacity of those units in the hands of the less efficient fishermen. The less efficient operators leave the fishery, which reduces total fishing capacity.

ITQs also give the individual operator much greater opportunity to take advantage of favourable market conditions. If, for example, market prices decline mid way through a season, a quota holder can elect to keep fishing or can save his quota for later in the season when prices may have recovered.

ITQs can be established in either absolute values (tonnes of catch) or as a proportion of a total allowable catch. The Government favours proportional allocation, as the total allowable catch can then be readily adjusted to prevent biological over-exploitation.

Although simple in concept, ITQs can sometimes present a number of practical difficulties when they are being implemented. Effective implementation presupposes sufficient knowledge of the biological resource, fishing costs and fish prices to allow an appropriate total allowable catch to be established. To maximise economic efficiency, the quota on which ITQs are based should be set at the level which maximises resource rents. If the total allowable catch is set too low, there can be a waste of potential profits (resource rents); if it is set too high, the result can be either over-exploitation of the resource or quota holders being unable to take their allocated quota or both. If quotas are not filled fishermen could lose confidence in the system and revert to the rush to maximise individual catches characteristic of aggregate quotas.

Ideally there needs to be an information base from several years of biological research and detailed records of commercial fishing operations on which to set a total allowable catch with some confidence. However, to wait for this information would mean that ITQs could be used only in well established fisheries where significant excess capacity may exist and where biological over-exploitation may have already occurred. In any event, all management control mechanisms require some judgments about the capacity of the fish stock to sustain exploitation — with input controls the total allowable catch is implicit rather than explicit.

Since the catch required to achieve maximum economic yield is, in most cases, less than that necessary to achieve maximum sustainable yield, a conservative total allowable catch can be set without fishermen being unduly concerned about the loss of profit forgone.

Even in fisheries where there is sound knowledge and understanding of the biology of the resource, implementing ITQs can be difficult if it is not possible to predict catch levels with a reasonable degree of accuracy. For example, in fisheries based on species with a short life cycle and subject to considerable environmentally caused fluctuations in stock levels, it may not be possible to accurately predict an annual total allowable catch. In these situations it may sometimes be possible to set a conservative quota initially, revising the quota later in the season if appropriate.

Monitoring ITQs can also present problems, particularly if landing places and marketing channels are diverse. Without effective monitoring an ITQ system is an ineffective management control. However it has been argued that fishermen will self-regulate by, for example, reporting those who sell catches outside the ITQ system because they value their fishing rights and want to safeguard the system.

Problems with using ITQs are compounded in multi-species fisheries. If ITQs are set for only one or two main species, targeting on other species can create problems with respect to discarding or high grading of those species for which ITQs have been set. (High grading refers to the practice of keeping only that part of the catch with the highest unit value.) To set ITQs for more than the main species increases administrative problems and does not overcome discarding. While various proposals have been put forward to overcome these problems (for example, allowing a percentage of ITQs to be retained (in addition to the allocated quota) as a non-quota by-catch), the problems remain.

The Government recognises that ITQs facilitate autonomous adjustment of fishing fleets and solve the problem of resource rent dissipation but also notes that there can be some problems with implementing them. The Government's position is that ITQs should be the preferred method for managing fisheries. Their practicality should be examined before other management controls are considered.

Taxation

From a theoretical perspective, one way of preventing the problems of biological over-exploitation and economic over-capitalisation is to tax all of the resource rent away. This means that operators would make only normal profits (including an appropriate allowance for risk) and there would be no incentive for additional investment to occur. While such an approach is theoretically possible, there are a number of reasons why it is not practical by itself.

If a tax were used in a fishery where the resource rent had already been dissipated it would impose undue hardship on fishermen. Such a tax would be an additional cost to fishermen and the marginal fishermen would become submarginal and be forced to leave the fishery.

Another major difficulty in using a tax as the principal management tool is calculating its correct level — the level that would collect all the resource rent. Given the variability of returns to fishing resulting from fluctuations in catch and fish prices the correct level of tax would be very difficult to calculate. If the tax were set too low, resource rents would be available for the taking, attracting additional investment (and rent dissipation). If it is set too high, fishermen would fail to make even a reasonable return, resulting in hardship, and there would be a suboptimal level of effort (and exploitation) in the fishery.

While using a tax as the sole or principal management tool may not be a practical proposition, a tax may well have a place as a supplementary tool in a fishery managed through some other means such as input controls. In these fisheries rent dissipation through over-capitalisation and input substitution would remain a problem, reducing the overall level of profitability. A tax would greatly reduce the incentive to over-capitalise and could improve the long term effectiveness of overall management. In these circumstances the objective of the tax would be to capture only some of the resource rent and so the level of the tax would be less critical.

Taxes would also be appropriate where as a result of restructuring there were increased resource rents. Taxes would prevent these increased rents from attracting greater effort into the fishery.

A tax or royalty payment can also be justified on the grounds of social equity. Fisheries resources belong to the community and, like other national resources, the Government believes that the community is entitled to a reasonable return where individuals benefit from the use of those resources. This is discussed in detail in the next section of this chapter.

Exclusive or collective rights

Because rent dissipation results from the lack of exclusive rights to an area of ocean or to individual fish prior to capture, resolving the problem of ownership would prevent rent dissipation.

While ITQs do not give an exclusive right over individual fish, they do guarantee to their holder the right to take a predetermined quantity of fish. This is not the case for management based on input controls.

In some fisheries it is possible to delineate geographically an area over which there can be exclusive individual rights. This approach works only where the resource can be kept within those boundaries — for example, oysters growing in relatively shallow waters where it is possible to mark and police boundaries, and where the sessile nature of oysters means that they stay within the boundaries. Because individual operators can exercise exclusive rights, they can not only retain any rents generated from harvesting wild stocks but also cultivate oysters to improve yields and the viability of the exclusive area.

This situation could be extended so that the rights to exploit a whole fishery were held by a single economic entity. It could be expected that a sole owner would aim to maximise profits and so restrict the number of boats used to the level necessary to maximise economic rent. While giving control of a whole fishery to a single entity is unlikely to receive much community support, it is sometimes argued that if responsibility for managing a fishery were passed to the fishermen involved, they would have the necessary financial incentives to act collectively as a sole owner, restricting total inputs to the level necessary to maximise resource rent.

Collective restraint by all fishermen would work only if all accepted the same degree of restraint. However, it would be in the interest of each individual fisherman to increase catching capacity and take advantage of the restraint of others. This would be economically rational behaviour for each fisherman while to act with restraint would be economically irrational. The Government does not believe that this approach will work for fisheries management other than in special circumstances. This is further discussed in Chapter 11.

3.4 Ownership of fisheries and distribution of rents

Australia has the sovereign right to exploit, conserve and manage the fish resources of the Australian Fishing Zone. Governments may on behalf of the Australian community choose to provide preferential rights — licences — to individual members of the community to exploit those resources and may for the sake of rational harvesting of those resources decline to provide similar rights to all other members of the community.

Most fisheries, if managed to achieve a reasonable degree of economic efficiency, are capable of producing substantial resource rents. For example, research by the Australian Bureau of Agricultural and Resource Economics indicates that rent dissipation in the Northern Prawn fishery in 1985–86 was in the order of \$38 million a year, and this may well be a conservative estimate.

The Government believes that where individuals or firms are provided with preferential rights to exploit a community resource, they should pay an appropriate charge to the community as owner of the resource.

Such charges by governments for the right to exploit community owned resources are often referred to as 'resource taxes', 'resource rent taxes' or 'secondary taxes'. These terms are misleading as these charges differ quite fundamentally from normal taxes such as income tax and company tax which are levies on economic activity.

The basis for imposing a charge for the use of a community resource rests with 'ownership'. If a fishery resource were owned by the private sector those allowed to use it would have to pay the private sector for that right. This payment would not be seen as a tax but rather as a price like the prices paid for goods used in everyday life. As the community owns the fisheries, it is reasonable for it to receive a price for the use of the fisheries resources in the same way as would a private sector owner. The alternative would be to have the benefits of use either accrue to a few individuals as windfall gains or be dissipated through wasteful investment in excess fishing capacity.

The rationale for imposing a charge for the use of public resources is not unique to fisheries. Royalty payments, both for privately owned and community owned (Crown) resources, are well established in the mining and forestry industries. Oil excise taxes and resource rent taxes are also paid for the exploitation of offshore petroleum deposits.

It should be recognised that, while the reasons for imposing resource rental levies in fisheries are the same as for other community owned resources, fisheries levies would also be a useful management tool if used in conjunction with other management controls. This is particularly so in those fisheries not suited to management through ITQs and where high profitability would probably lead to over-capitalisation in unregulated inputs as individual fishermen attempted to maximise their share of resource rents (discussed in the previous section).

To prevent resource rents from being dissipated adjustment of the fishing fleets — that is, a reduced number of operators — is necessary. As noted earlier, where ITQs are used, adjustment is achieved through the marketplace, but where ITQs are impractical and input controls are used instead, structural adjustment to reduce fishing capacity has to be achieved independently of the management controls. The Government believes that it is appropriate for it to become involved in the restructuring and rationalisation of fishing fleets. As the resource rents that emerge as a result of such restructuring are additional to the resource rents capitalised into the value of fishing rights, the Government believes that it should impose a resource rental levy on these 'new' rents to provide a return to the community for the exploitation of its resource. The issue of adjustment is addressed further in Chapter 7.

If levies were not imposed and fisheries were restructured so that resource rents were no longer dissipated and were left with the fishermen, the rents generated from restructuring would be capitalised into the value of access rights. The existing participants would receive a windfall gain. This would add greatly to the cost of further restructuring as these capitalised values would then become part of the cost of that further restructuring.

Options for sharing resource rents

There is considerable recent literature on resource rents, particularly in the mineral and petroleum industries, and various means of sharing these rents.

The main methods of sharing resource rents include auctioning access rights, imposing levies or royalties on output (or the value of output), taxing high levels of profit through the company tax system, and introducing a 'resource rent tax' that is additional to company tax and which allows tax offsets for losses incurred in the preproduction phase. It is beyond the scope of this report to review or analyse all these options, and indeed some of these methods appear to be more applicable to the large scale, long lead time investments required for mineral and petroleum exploration and production than to fisheries exploitation. In the fishing industry the main options appear to be auctioning fishing access rights, imposing levies or access fees on fishing activities, imposing a landing tax, or leasing access rights (for example, quota) from the Government.

Auctioning access rights

Providing information is freely available and the auctioning process is competitive, the winning bid at an auction will reflect the present value of the future stream of profits that an asset will generate. The auctioning process is therefore an efficient means of allocating access rights to fisheries. If potential bidders have incomplete information but suspect that the likely returns will be high, they will have an incentive to seek better information.

While the Government considers that competitive bidding is an efficient and equitable way of allocating access rights in developing fisheries, it also believes that the auctioning of access rights would be inappropriate in developed fisheries. In most developed fisheries a well established set of access rights already exists and fishermen have invested in boats and equipment in the expectation that these rights are ongoing. In addition, in existing fisheries, resource rents have already been capitalised into the value of access rights, with many fishermen having purchased these rights.

For this reason the Government reiterates its previously stated policy that it will not auction the access rights of existing fishermen in developed fisheries. The auctioning of access rights in developing fisheries is discussed further in Chapter 5 as is the role the Government intends to play to ensure that adequate information about the resource is made available to prospective bidders.

Imposing fishing levies or access fees

Fishermen already pay a levy to cover some of the management costs associated with their respective fisheries. It would be administratively simple to increase the levy to include some of the resource rent available in the fishery. However, there are also problems with this approach.

First, if the objective was to collect all or most of the resource rent it would be difficult to set the levy, as the appropriate level would be determined by the amount of rent available, which would fluctuate with fishing costs, the size of the catch and market conditions. This problem would be of reduced significance if only a part of the resource rent was to be collected through a levy. Second, if the levy was imposed as a fixed payment per boat it would take the form of a flat tax, and so would not be related to the resource rents it was intended to capture. However, in fisheries managed through ITQs or through input controls that closely reflected fishing capacity the levy could be based on quota holdings or holdings of input units which should form a more satisfactory base for an equitable resource rental levy.

Imposing a levy on landings

A levy based on fish landed would be one of the most equitable ways of recovering a proportion of the resource rent. Ideally such a levy should be directly proportional to the value of the catch landed (it would be directly proportional if based on catch value rather than quantity landed). It should therefore have a close relationship to profitability.

Imposing a levy on landings would have similar enforcement problems to ITQs, and fisheries suited to such a levy would usually also be suitable for management by ITQs, provided there were no other problems such as difficulties in setting the total allowable catch.

Leasing access rights

Access rights can be granted for very short periods, or on a long term basis. What access period or combination of periods is chosen for a particular fishery will depend on a number of factors, including the characteristics of the fishery and its stage of development.

Relatively short term access rights give better control over fishing capacity than do access rights for longer periods, as it is possible to reduce capacity quickly by not renewing rights or increase it by allocating additional rights. Short term access rights also provide a convenient method of collecting the charge for industry access to the resource, for example, by regularly auctioning access rights.

On the other hand, relatively short term access rights may adversely influence investment patterns so that insufficient investment occurs and economic efficiency is reduced. For example, it would be unrealistic to expect fishermen to justify the purchase of a fishing boat on the basis of a one year licence. The relative importance of each of the benefits and costs of this and other options for sharing resource rents would need to be considered before any decision on the appropriate access period was made.

3.5 The Government's responsibilities

The Government has responsibilities both to the community and to the fishing industry which is the major user of fisheries resources.

As fisheries are a community owned resource, the Government must ensure that biological over-exploitation does not occur and that the level of exploitation is consistent with the likely demands of present and future generations. It must also ensure that fisheries resources are exploited efficiently to maximise benefits to the industry and the nation.

Intervention is required to determine access to the resource and the terms and conditions attached to access rights, including the appropriate access fees. Once access is determined, the Government believes that market forces should play a major role in investment decisions. This will ensure that resources are used more efficiently and that the costs associated with regulation are minimised. It also provides greater scope for industry participation in administrative decisions.

A major responsibility which the Government has to industry is to provide a more certain policy environment in which to operate. Access rights should clearly indicate the nature of the rights being conferred. For example, if a proportional ITQ system is used, the rights which are conferred should leave quota holders in no doubt that they do *not* have a right to an absolute tonnage of fish, but rather to a proportion of a total allowable catch set annually.

Currently the nature of fishing access rights are poorly defined. Under the *Fisheries Act 1952* a one year fishing licence may be granted. While it is reasonable for fishermen to expect that a licence will be renewed each year, there is no guarantee of this nor does the Act indicate under what circumstances the licence may not be renewed. When investors consider any investment they need to know the period over which returns on the investment are to be calculated. If there were no expectation that a licence would be renewed, investment in the fishing industry would virtually cease.

The Government accepts that it has a responsibility to set out the conditions attached to fishing access rights as clearly and simply as possible.

The Government will establish a formalised register of fishing access rights that will enable fishermen to have better documentation of their rights than at present. This will assist fishermen if they wish to borrow against the value of a fishing access right.

The Government has also decided to formally recognise the ongoing nature of rights in existing developed fisheries. This recognition will not prevent the Government from placing conditions on or varying the nature of such rights when required for fisheries management purposes or to facilitate structural adjustment; nor will it prevent the Government introducing additional management measures that apply to all fishermen in a particular fishery. Compensation is not appropriate when management conditions associated with fishing rights are varied. This is discussed further in Chapter 7. Such rights will, moreover, still be subject to suspension or cancellation for breaches of fisheries law.

Finally, the Government acknowledges that fishermen are entitled to be consulted and to be involved in the formulation and operation of management measures. The Government places considerable importance on this matter and is proposing to increase the industry's input into management. This is discussed further in Part II of this statement.

4. The Role of Administration in Fisheries Management

Key objectives

- Management controls in commercial fisheries should minimise the impact of restrictions on the industry without compromising the conservation and economic objectives of management.
- Charges imposed on the fishing industry should reflect the relative magnitude of rights held but should not otherwise discriminate between individuals.
- Decisions about the allocation of fishing access rights should be subject to review by a specialist review panel.
- The proportion of management costs recovered from the fishing industry should be the same proportion of management benefits that the industry enjoys.
- Fisheries legislation is to be revised to provide a simpler but more effective base for fisheries management in line with the objectives outlined in this statement.

The nature of management controls and how they are imposed have an important impact on the effectiveness and efficiency of the controls used. The overall philosophy of the Government is that the means of control should not compromise the conservation or economic objectives of the controls.

4.1 Administrative principles

Regardless of the type of management control used, the administration of management should ensure:

- economic efficiency;
- social equity;
- administrative simplicity;
- effectiveness in meeting conservation and/or economic objectives; and
- communication with industry.

But it needs to be recognised that no management control will ever be capable of meeting all administrative criteria.

Economic efficiency

The Government believes that, wherever possible, management controls should be neutral in terms of resource allocation. That is, the controls should not influence investment decisions in any particular direction, as to do so would interfere with economic efficiency. Controls which result in additional costs for the industry or which lead to technologically inefficient combinations of inputs (for example, as a result of input restrictions) would not meet this criterion.

Social equity

The Government believes that the principle of horizontal equity — people in similar circumstances should receive similar treatment — must play an important role in fisheries management. It believes that the principle should apply to all Australian fishermen when determining initial access to fisheries. It further believes that management should not discriminate on the basis of the type of ownership (owner-operator or company, etc). Levies and other charges for the right to fish commercially should reflect the relative magnitude of the fishing rights held, but should not otherwise discriminate between fishermen.

The principle of vertical equity involves making comparisons between people in different circumstances. Its basis is that those with greater ability to pay or more options open to them should pay proportionately more than those without similar advantages. This type of equity is demonstrated in the progressive income tax system. However, in a regulatory context such as fisheries management, where one of the objectives is to promote efficient exploitation of the resource, it is inappropriate to disadvantage the more efficient operators relative to marginal operators by giving the latter preferential consideration. Nevertheless, the principle of vertical equity is a relevant consideration in adjustment policies for fisheries. When designing an adjustment program it may be quite appropriate to target those in the worst circumstances and provide them with greater adjustment assistance. This is consistent with adjustment policies adopted for other rural industries.

Administrative simplicity and transparency

The Government considers that management controls should be as clear cut as possible without undue complexities. Both the administration of the controls (issue of licences, maintenance of unit registers, collection of levies and other controls) and the implementation of the controls (particularly compliance) should be simple and as cost effective as possible.

Management systems should be designed to be ‘user friendly’ and simple to maintain and adapt to changing needs, as well as simple to use.

The Government also considers it essential that the administration of fisheries should be open to public scrutiny. This is further discussed in Part II.

Management effectiveness

The Government believes that each fisheries management program should contain a clear statement of its objectives, and the specific controls adopted should have a clear relationship to those objectives. Once in place the management measures should be reviewed periodically to determine how effective they are in achieving those objectives.

Measures introduced should be robust and not easily circumvented. There is little point in trying to control fishing effort by, for example, limiting the number of boats permitted to operate, unless effective boat replacement rules or controls on the quantity of gear that can be used are also implemented.

There is an economic incentive for fishermen to improve their relative position and to adopt more efficient technology. Management plans should aim to harness these incentives rather than to erect barriers to constrain them. To achieve this aim it is particularly important to allow market forces to play their part in the distribution of fishing access rights.

Communication

Effective two-way communication between fishermen and fisheries managers is essential. Management controls must be designed with the particular characteristics of the fishery in mind, and the industry must be involved in formulating these measures. No matter how appropriate the management controls may be, they will not be effective unless the industry understands them and also understands the reasons why they are necessary.

One way the Government currently communicates with the industry is through management advisory committees. This avenue is supplemented by newsletters to participants in Commonwealth managed fisheries. However, these measures may not be enough. The whole question of how to involve industry participants in management planning and make them aware of scientific research relevant to their fishery is discussed in Chapters 8, 11 and 12.

Fishermen and the general public also need to be kept informed about the details of the management controls, the objectives of management controls and the responsibilities of each fisherman with respect to management.

4.2 Rights to appeal

The Government firmly believes that there should be an independent forum for reviewing the merits of administrative decisions relating to fisheries management. This forum should be able to assess against the objectives of the applicable management plan, the merits of each case and the relative merits of all other fishermen's cases.

Fisheries management decisions are made to ensure the long term viability and efficiency of the fishery. This principle of the common good often means a fishery manager has the burden of spreading the impact of

a management restriction over all participants in the fishery. To do this the fishery manager must not only assess the merits of each individual case, but also compare that case with the cases of all other applicants and consider the implications of any decisions on the management plan for that fishery. Where there is a total allowable catch or set number of access rights specified in a management plan any increase to one fisherman's allocation directly affects all other fishermen by reducing the value of their individual allocations.

At present fisheries management decisions are reviewed by the Administrative Appeals Tribunal. When undertaking reviews the Tribunal does not compare all access rights; nor does it make adjustments to limit the total allocation of access rights to the predetermined level of fishing capacity. Indeed it would be unreasonable to expect the Tribunal with its limited resources to acquaint itself with all cases within a fishery in which a review had been sought, or to acquire a full understanding of how a particular level of fishing capacity had been set. Where the Tribunal increases an allocation or makes an allocation where one was previously denied, the effectiveness of the management plan to conserve and protect the resource and provide a stable foundation on which the fishing industry can operate may be reduced. This will be exacerbated if the success of some appeals to the Tribunal engenders further appeals. The Tribunal in effect can substitute its own determination of the appropriate level of fishing capacity for that of the fishery manager, even though the Tribunal is unlikely to have the specialist knowledge required to make such decisions.

For the above reasons the Government has decided, in principle, to establish an independent specialist fisheries review panel to review decisions about the allocation of fishing rights. The determinations of this panel will not be subject to further appeal to the Administrative Appeals Tribunal.

At the same time the Government will ensure that there is greater openness in the primary decision making procedures. The Administrative Appeals Tribunal will continue to review fisheries management decisions other than those concerned with the allocation of rights, for example suspension or cancellation of licences.

4.3 Cost recovery

The Government believes that in general the beneficiaries of services, including management controls, should meet the costs of those services. Consequently, industry should contribute to management costs in proportion to the benefits it receives. A study by the Bureau of Agricultural Economics in 1986 concluded that in the commercial fishing industry at least 90 per cent of the market benefits of management go to fishermen.

The Government began recovering management costs in 1985 – 86 when \$0.44 million, 38 per cent of attributable management costs, were recovered from the Northern Prawn and Southern Bluefin Tuna fisheries. By 1988 – 89 this had increased to \$3.03 million, 75 per cent of attributable costs in ten separate fisheries. In 1989 – 90 the level of cost recovery will increase to 90 per cent. In considering this aspect of management administration it needs to be recognised that attributable

costs — costs incurred by the Government because a commercial fishery exists — are only a part of the annual cost of the Australian Fisheries Service. In 1988 – 89 the total cost less offsetting revenue of the Australian Fisheries Service was \$17 million.

The Government does not accept the argument advanced by some in the industry that if fishermen have to pay for the cost of services provided by Government to the fishing industry then fishermen have the right to determine fisheries policy. These payments are justified on the grounds that the Government provides services such as administration, research and enforcement that enable fishermen to enjoy preferential rights to particular fisheries. It is reasonable to expect fishermen to contribute to the costs of these services.

The Government does not deny that fishermen have a right to a significant input into fisheries management decisions (including those that directly affect management costs). However, this right results from the impact management decisions have on fishermen and is independent of the question of who meets the cost of management.

A clear distinction needs to be made between recovering costs and imposing a charge for exploiting a community owned resource for private gain. Management costs are part of the cost of exploiting a fishery, just as much as are costs incurred by individual fishermen. These costs are incurred regardless of whether the fishery is, or is not, profitable. A charge for the right to exploit a community owned resource is, on the other hand, a charge imposed by the owner of the resource on those allowed commercial access to the resource. As a commercial levy this charge can be expected to reflect the profitability of the fishery. Moneys paid by the industry as cost recovery levies are used directly to fund fisheries management. Charges imposed for the right to exploit a community resource will become part of general Commonwealth revenue.

4.4 Legislation

Administration can be enhanced or impeded by the legislation through which it must operate. The main legislation which regulates Commonwealth managed fisheries is the *Fisheries Act 1952*. The Government recognises that implementing some of the changes outlined in this policy statement will require changes to that Act. It also recognises that recent developments, particularly the changes in the United Nations Law of the Sea Convention and under the Offshore Constitutional Settlement, mean that the existing legislation is not well suited to the needs of the Australian fishing industry in the 1990s.

The Government will therefore undertake as a priority a complete review of the *Fisheries Act 1952* and associated fisheries legislation, with a view to providing a simpler and more effective legislative base for managing the nation's fisheries resources. This will be done as part of the proposed suite of legislation outlined in Chapter 12.

The changes in the approach to fisheries management indicated in this statement, particularly those related to improving economic efficiency, will require amendments to existing fisheries management plans. These management plans will form the major legislative focus for managing

fisheries and will include some matters that currently are set out in fisheries notices. Fisheries notices will be used for short term regulatory needs. Management plans will include:

- a description of the fishery (by area, fish species and/or fishing method);
- the purpose and objectives of the plan;
- the methods and/or equipment which can be used in the fishery;
- the activities/boats which are permitted in the fishery area;
- the conditions to be satisfied in order to be eligible for fishing access rights;
- the authority necessary for lawful operations within the fishery (for example, individual transferable quotas, boat units or a fishery specific licence); and
- the method by which the total allowable catch or maximum level of fishing capacity will be set.

Part II of this statement deals with new administrative arrangements for Commonwealth fisheries. Legislative changes needed for implementing these arrangements are discussed in Chapter 12.

5. Development of New Fisheries

Key strategies

- The process of developing new fisheries involves gathering data that will enable decisions on management and commercial exploitation to be made with greater certainty:
 - the Government sees exploratory fishing and feasibility fishing as a means of gathering data.
- New fisheries should be developed so as to avoid over-capacity and to ensure a reasonable return to the Australian community:
 - competitive bidding is seen as an appropriate way of allocating rights to such fisheries.
- Preference will be given to Australian fishermen except where the net economic benefit obtained is significantly less than could be obtained from foreign exploitation.
- Existing foreign fishing arrangements will be periodically reviewed to ensure that returns to the Australian community are maximised.

The objectives of fisheries management — discussed in Chapter 3 — need to be pursued from the outset of a fishery's development if the problems now evident in most developed fisheries worldwide are to be avoided. The challenge facing the Government is to develop policies which meet all of the management objectives and provide the fishing industry with sufficient incentives to accept the risks associated with developing new fisheries or resources.

This chapter is concerned mainly with the development of fisheries for which no access rights have been established. The Government's challenge is more complicated when a new resource is discovered within an existing fishery, as was the case when orange roughy was discovered in the South East Trawl fishery (discussed in Chapter 6).

5.1 Prospects in the Australian Fishing Zone

Most of Australia's established fisheries are at or near full exploitation and some are over-exploited. Therefore for the fishing industry to expand, currently under-utilised or unutilised fisheries resources need to be exploited. Such resources may be known to exist but are not commercially exploitable given present fishing costs and market prices (for example, squid resources around much of Australia) or may not have yet been identified. The latter include resources in remote and/or unexploited areas of the Australian Fishing Zone and resources within areas now exploited for other species (for example, scale fish in the Northern Prawn fishery).

Despite the large size of the Australian Fishing Zone, present indications are that the probability of discovering major fish resources which could form the basis of significant and sustainable new fisheries is low.

Because it is thought that most resources in the Australian Fishing Zone are already being exploited, future fisheries development inevitably has to be directed at those areas or species with declining prospectivity. This will entail significant costs and high commercial risks. Traditionally, commercial fishermen have accepted these risks with the expectation that if they are successful they will be granted access rights to the new resource. However, such an uncontrolled approach to developing new fisheries has frequently been inconsistent with the objectives of fisheries management and has frequently led to resources being over-exploited and the fishery over-capitalised.

The Government believes that much of the past unregulated development of fisheries has stemmed from the Commonwealth Fishing Boat Licence, which allows a holder to fish in any part of the Australian Fishing Zone which is not closed by a fisheries notice. As fisheries notices apply only to developed fisheries there is virtually no control over fishing in new or developing fisheries. When a new fishery is discovered, other fishermen tend to rush in and by the time controls are introduced 'historic rights' have been established, fishermen are often over-capitalised and the fishery is subject to excessive fishing pressure.

This problem with Commonwealth Fishing Boat Licences is discussed further in Chapter 7.

5.2 Data gathering

When the Government wishes to encourage development of a particular fishery or particular area, its first task is to gather and disseminate information about that fishery or area in order to decide whether it will attract commercial interest.

In many cases there will already be some data about a potential fishery or area:

- information from past fishing activities, and anecdotal reports of possible resources;
- oceanographic data, including nature of the sea bed (if demersal fishing), water depth, bottom contours, bottom type, sediment and currents;
- biological data, including nutrient levels and seasonal factors likely to affect the productivity of the resource;
- data from remote sensing observations; and
- experience in similar environments elsewhere.

If the available data indicate some prospects for commercial exploitation, the Government may consider exploratory fishing is worthwhile. Any exploratory fishing program should aim to provide 'maximum data at minimum cost'. It should therefore concentrate on filling the gaps in the

existing database. Such a program would need careful planning and supervision and could be undertaken by the Government or by commercial fishermen.

While individual fishermen have played the major role in determining the extent and limits of established fisheries they have generally played only a limited part in the discovery of new fisheries. Although their speculation about the prospectivity of new areas might have provided the initial interest in development, most existing fisheries were developed following government initiated and financed surveys. For example, the inshore grounds of the South East Trawl fishery were developed following exploratory trawling by the Commonwealth owned *New Endeavour* and in the deeper water areas (which held gemfish) by the NSW Government's research vessel *Kapala*.

The Government will continue to be directly involved in exploratory fishing activities, although this may be on a limited basis. The Government will also develop appropriate incentives that will encourage commercial interests to be involved in exploratory fishing.

5.3 Feasibility fishing

Feasibility fishing is a means of assessing the commercial viability of a fisheries resource. It can result either from an initiative of an individual or company or from the Government calling for expressions of interest from those prepared to undertake such a venture.

Feasibility fishing is best undertaken by commercial fishermen and involves a contractual agreement between the Government and those undertaking the fishing. The Government's chief objective for feasibility fishing is to gain data about the size of the resource and its commercial viability. The objective of the commercial operators undertaking the fishing is to determine the likely profitability of the resource. For these reasons it is important that the conditions of the feasibility fishing contract or access agreement do not prevent commercial fishing strategies from being pursued.

An individual fisherman or fishing company can initiate a feasibility fishing project by putting to the Government a specific program for fishing an under-utilised resource or area. If the benefits offered are sufficient, the Government may enter into a contract with the fisherman or fishing company. If two or more fishermen show interest in conducting feasibility fishing in the same area, feasibility fishing rights will be allocated through competitive bidding.

In some circumstances prior arrangements may have been entered into with fishermen to undertake exploratory fishing in exchange for feasibility fishing access rights.

The Government can also initiate feasibility fishing by drawing together available data as outlined in section 5.2 and calling for expressions of interest to undertake feasibility fishing.

The terms and conditions under which feasibility fishing are undertaken need to be tailored to each fishery. However, in general they should specify:

- the period of access, including any entitlement to continued operations if the venture proved economically viable;
- access levies and the method to be used for collection;
- the areas involved;
- the fishing methods to be used and/or the species to be targeted;
- the number and size of boats to be operated;
- the data to be supplied;
- the required fishing patterns (if appropriate); and
- the minimum performance criteria.

Because feasibility fishing allows fishermen to exploit a resource in accordance with their own profitability criteria, in cases where prospectivity is good it should be possible to auction areas for the rights to undertake feasibility fishing. In areas where prospectivity is low or for which less information is available it may be necessary to negotiate feasibility fishing agreements with potential participants. The parts of an agreement most likely to be negotiated are the minimum performance criteria, the access area and especially the access period. Naturally those undertaking feasibility fishing want the period of access — when they would have preferential fishing rights — to be as long as possible.

While it is conceivable that in some circumstances feasibility fishing agreements could have a term of up to five years these agreements will not confer any preferential rights to the holders with respect to longer term rights, should their fishing show that the resource could sustain continuing commercial fishing.

The Government will allow foreign interests to participate in feasibility fishing as long as the Australian community benefits from their fishing. The level of benefits obtained will be influenced by the type of fishing operations proposed and the validity and reliability of the information provided.

Feasibility fishing is an essential part of developing unexploited resources into a commercial fishery.

5.4 Sustained commercial exploitation

The information gained from feasibility fishing should enable decisions to be made about potential fisheries resources. If the information on catch rates and fishing costs indicates that the prospects for sustained commercial exploitation are good, a formal management plan should be introduced.

This plan should outline the whole management structure for the fishery as well as the access fee and method to be used for its collection. As already pointed out, the Government prefers individual transferable quotas for managing a fishery. Where these are not appropriate a well structured system of input controls should be developed. When determining an appropriate total allowable catch or the fishing capacity to be allowed into the fishery, a conservative approach should be taken.

There are a number of arguments supporting a conservative approach:

- it is easier to expand the level of fishing at a later date than it is to contract it;
- in nearly all cases the level of fishing effort required to achieve the maximum economic yield from a fishery is less than that required to take the maximum sustainable yield; and
- initial catch rates in a new fishery with a large biomass may give a false impression of the longer term maximum sustainable yield.

By taking a conservative approach to setting fishing limits the Government's management objectives of conserving the resource while efficiently exploiting it can best be achieved.

Once a management plan is in place fishing rights should be allocated in a manner consistent with the principles discussed in Chapter 3 — that is, by competitive bidding. In order for this to be effective the Government will make available relevant information collected during the exploratory and feasibility fishing phases. The Government will permit foreign interests to participate in this process under specified circumstances which are discussed in the next section.

The Government recognises that allocating fishing rights on the basis of a once only bid, regardless of whether input or output controls are used, means that the community will not share in any future resource rents that may result from increases in the value of the resource. To avoid this, fishermen who obtain fishing rights in this way will also be subject to an annual fishery access fee, to be announced prior to the auction (or tender), and to be determined on a fishery specific basis. This fee will be additional to cost recovery of management expenses and any research levies, and will represent a charge levied by the community for the private use of a publicly owned resource. It will be reassessed periodically to ensure it remains appropriate.

In some cases, for example where there is some uncertainty, it may be preferable to allocate rights to a new fishery for a limited period rather than on a long term basis. The methods of allocating rights and collecting access fees should be determined on a case by case basis and should be clearly specified in the particular management plan of each fishery.

5.5 Foreign fishing

The Government considers that foreign fishermen can undertake exploratory and feasibility fishing if they are suitable for the project and cost-effective relative to Australian fishermen. In assessing the suitability of foreign fishermen for exploratory and/or feasibility fishing, the Government will consider the contribution they could make to Australia's knowledge about the commercial viability of the fishery. The Government will also consider wider issues than those pertaining solely to the fishing industry — for example, foreign policy.

In general the Government's policy on fishery development and commercial exploitation is to give preference to Australian fishermen, provided that the net economic benefits to Australia from Australian exploitation are not significantly less than those obtainable from foreign exploitation.

The Foreign Investment Review Board will continue to monitor proposals for foreign investment to ensure that situations of monopoly power are not created which could disadvantage the Australian fishing industry.

The freeing up of the import restrictions that previously applied to foreign built second hand fishing boats should provide opportunities for Australian interests to investigate new fisheries and to compete more effectively with foreign boats.

If Australian fishermen were to show no interest in exploiting a fishery the Government would seek interested foreign fishermen, allocating fishing rights through competitive bidding (its preferred method). Although the highest bidder could normally be expected to gain the rights, other considerations such as poor past performance might result in a lower bid being accepted. The bids would reflect the anticipated resource rents from the fishery. Successful bidders would be required, as usual, to contribute to the management costs of the fishery.

The recently released document *Guidelines for Applications for the Use of Foreign Fishing Vessels in the Australian Fishing Zone*, produced by the Australian Fisheries Service in August 1989, identifies in more detail the type of information required and the conditions attached to foreign fishermen in the Australian Fishing Zone.

The Government believes that the policy of maximising returns to the Australian community should apply to existing foreign fishing arrangements as well as to new arrangements. Accordingly, the Government will undertake periodic reviews of foreign fishing access fees under existing arrangements to ensure that these returns are maximised.

Foreign participation in Australian fisheries

In conformity with the principles in the United Nations Convention on the Law of the Sea, Australia is obliged to allow foreign fishermen access to that proportion of the allowable catch from the Australian Fishing Zone that Australian fishermen are unable to take. With the proclamation of the Australian Fishing Zone in 1979, Japan and Taiwan immediately entered into bilateral fishing agreements with Australia to operate in the Zone. Since then several other countries have entered into similar agreements.

In 1988–89 four countries had boats fishing in two Australian fisheries (Japan in the Southern Bluefin Tuna fishery, and Thailand, Taiwan and China in the Northern Trawl fishery). They paid a total of \$4.8 million in access fees, three-quarters of this being paid by the Japanese fishermen. The largest amount paid in access fees in any one year was just under \$5 million in 1986–87, 64 per cent of this from Japanese fishermen. In that year Taiwanese fishermen paid \$1.7 million, 35 per cent of the total. Since that time the length of gillnet which can be set has been restricted to reduce the incidental catch of dolphins. Consequently, the Taiwanese have withdrawn from gillnetting and the fee that they are required to pay has been reduced. In 1988–89 Taiwanese fishermen paid only 10 per cent of the total of access fees paid.

The access fees paid by foreign based boats cover management costs as well as a return to the Australian community for use of the fisheries resources.

Foreign fishing in the Australian Fishing Zone in 1988–89

Agreement	Boats licensed	Access fee paid	
		\$	\$m
Bilateral (a)			
Japan	290		3.392
People's Republic of China	14	304	0.336
Joint ventures			
ATBOA-JTF (Japan) (b)	20	98,874	
KKFC Pty Ltd (Taiwan)	18	630,000	
Karina Fisheries Pty Ltd (Honduras)	1	—	
Karina Fisheries Pty Ltd (Japan)	1	—	
Bluefin Exporters Pty Ltd (Japan)	2	—	
Seanorth Pty Ltd (Thailand)	14	279,000	
Port Lincoln Tuna Processors Pty Ltd (Japan)	1	—	
Darabick Pty Ltd (Japan)	1	6,000	
East Australian Fishing Co Pty Ltd (Japan)	1	1,500	
Kailis & France Pty Ltd (New Zealand)	1	6,000	
Marine Resources Pty Ltd (Norway)	1	6,000	1.027
	<u>365</u>	<u>6,000</u>	<u>4.755</u>

(a)—Bilateral agreements with the Government of Australia.

(b)—Australian Tuna Boat Owners Assoc (ATBOA) — Japan Tuna Federation (JTF).

Source: Australian Fisheries Service

6. Case Studies of Managed fisheries

Key lessons

- Excessive fishing capacity and effort in Australia's fisheries have reduced stocks and dissipated potential resource rents.
- The substantial over-capacity in most of Australia's main fisheries is the main difficulty facing fisheries managers.
- The management controls used should incorporate incentives for efficiency rather than constraints on efficiency.
- While existing adjustment programs have had some success in reducing over-capacity, the rate of adjustment has been too slow to provide any worthwhile and lasting benefit.

In recent years the Commonwealth has been developing and implementing management plans for those fisheries for which it has management responsibility under the Offshore Constitutional Settlement.

In the sections that follow five Commonwealth managed fisheries are examined to highlight the problems encountered with existing management plans in their various stages of implementation. From this information general conclusions are drawn.

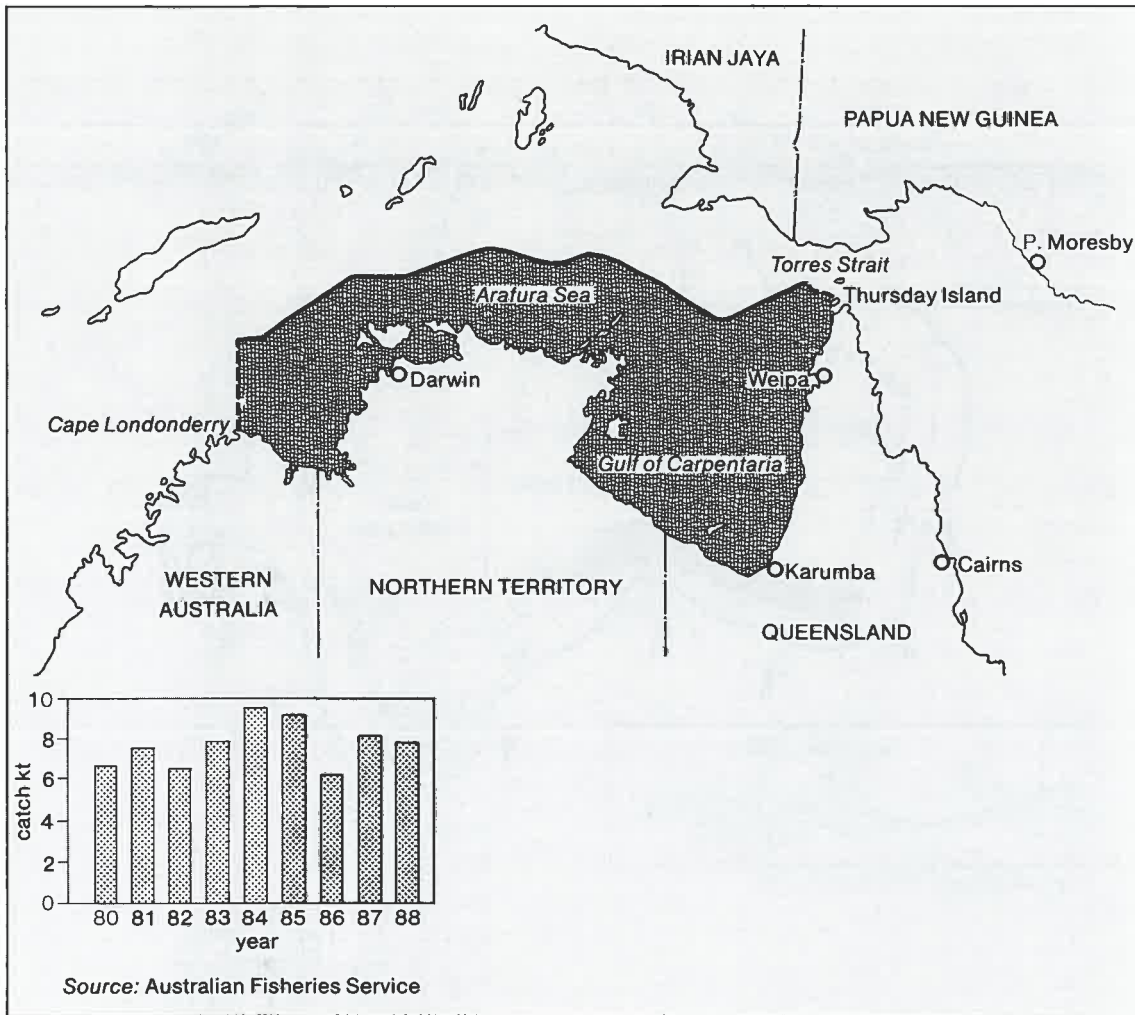
6.1 The Northern Prawn fishery

As shown by Figure 6.1 the Northern Prawn fishery extends across northern Australia from Cape York west to Cape Londonderry on the western side of Joseph Bonaparte Gulf. In 1988 the fishery generated revenue of \$135 million from a catch of 7.9 kt.

The Northern Prawn fishery has been managed using limited entry controls since 1977. The present management structure, based on units of fishing capacity, was introduced in 1984. The complex set of input controls include gear restrictions and area and seasonal closures, many of which were introduced in 1987 because of evidence that key species were being over-fished. These measures appear to have at least temporarily allowed stocks to recover. Unfortunately, however, some of the management controls have created their own inefficiencies.

Excess fishing capacity is recognised as the major long term problem in the fishery. Research by the Australian Bureau of Agricultural and Resource Economics indicates that to maximise economic efficiency the fishery fleet needs to be reduced from the existing 230 to about 80 boats. This research also indicates that based on 1985–86 figures, at least \$38million in potential resource rents were being dissipated in this fishery each year.

Figure 6.1
The Northern Prawn fishery

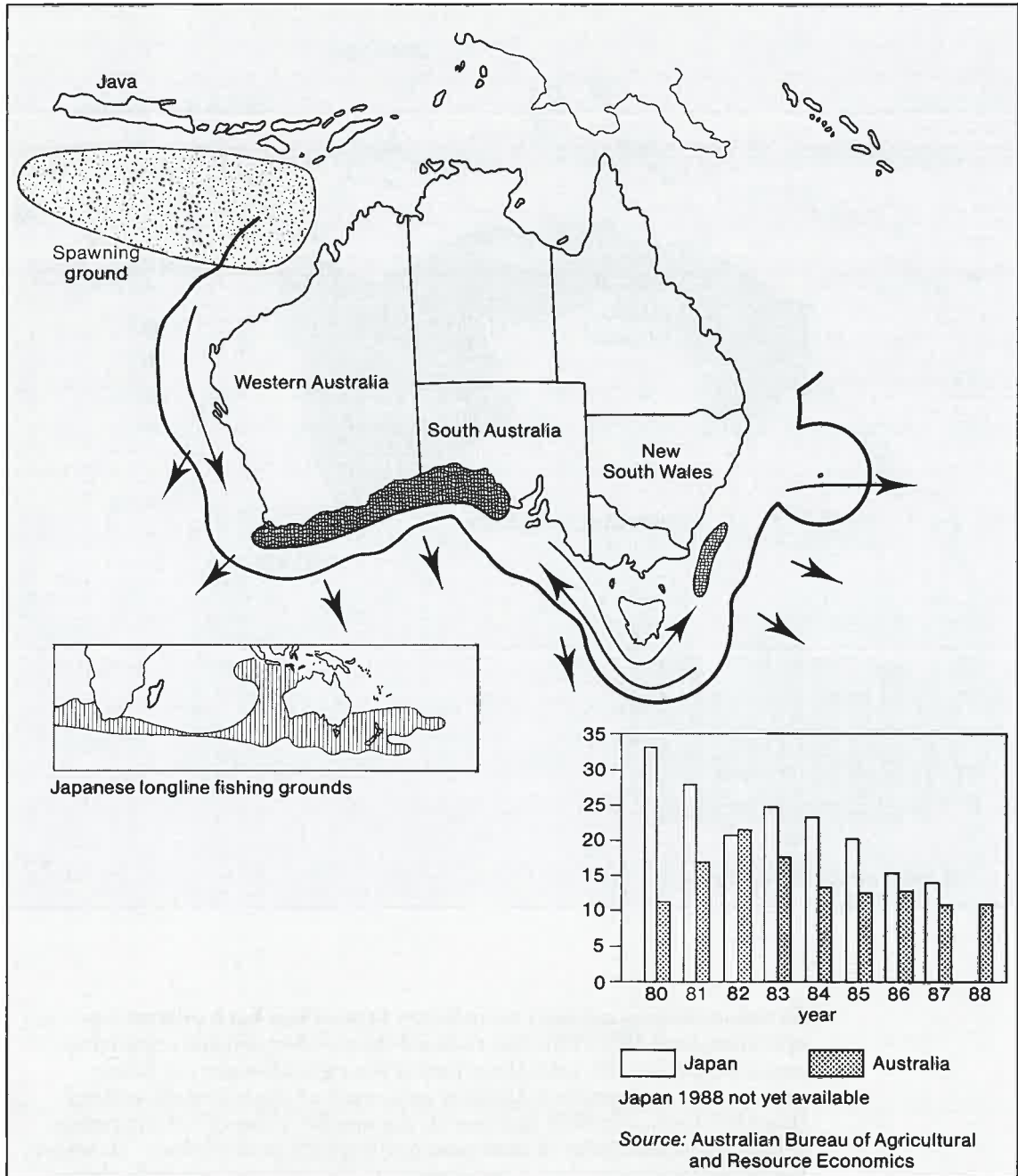


To reduce fishing capacity an industry funded buy-back scheme has operated since 1985. This has reduced the number of boats entitled to operate by about 70, with about half of the rights bought out being previously non-operative. Largely as a result of the buy-back activity there has been a fivefold increase in the market value of fishing rights, reflecting expectations of increased profitability in the fishery. However the pace of restructuring is too slow given the ongoing loss of dissipated resource rents.

6.2 The Southern Bluefin Tuna fishery

The Southern Bluefin Tuna fishery is based on a single, highly migratory species which spawns in the Indian Ocean south of Indonesia, and migrates through the southern oceans between 30° and 50° south. As is shown in Figure 6.2 the fish tend to move in an easterly direction around the south of the Australian continent as they age.

Figure 6.2
The Southern Bluefin Tuna fishery



Southern bluefin tuna are fast growing and are fished commercially from the age of two or three years; however, they do not commence reproduction until they are about eight years old and can live for up to 20 years. Because of their long exposure to fishing activity prior to spawning the species is highly vulnerable to over-fishing.

The Southern Bluefin Tuna fishery is the only major Australian fishery that extends into international waters. It is fished not only by Australian fishermen but also by the Japanese and New Zealand fishermen using

various fishing methods. This complicates management since annual total allowable catches must be determined through trilateral agreements. Annual catches from the fishery have fallen greatly since 1980.

The Southern Bluefin Tuna fishery is the only major Australian fishery managed through individual transferable quotas. The introduction of ITQs in 1984 together with a substantial reduction in the total allowable catch caused a rapid restructuring of the fleet. Boat numbers declined by about 80 per cent, enabling the operating costs of remaining fishermen to fall and their profitability to rise.

Southern Bluefin Tuna have been heavily over-exploited, especially during the early 1980s prior to the introduction of ITQs, and despite severe cuts to the catch taken by each nation in the trilateral agreement, the resource has continued to decline. The Prime Minister announced in his July 1989 statement on the environment that Australia would press for a moratorium on southern bluefin tuna fishing to facilitate stock recovery. While a global moratorium was unachievable in the short term, a 64 per cent reduction in global catch has been achieved between 1987–88 and 1989–90. The global quota for 1989–90 is 11 750 tonnes.

Management of the fishery has been hampered by an inadequate knowledge of the population dynamics of tuna.

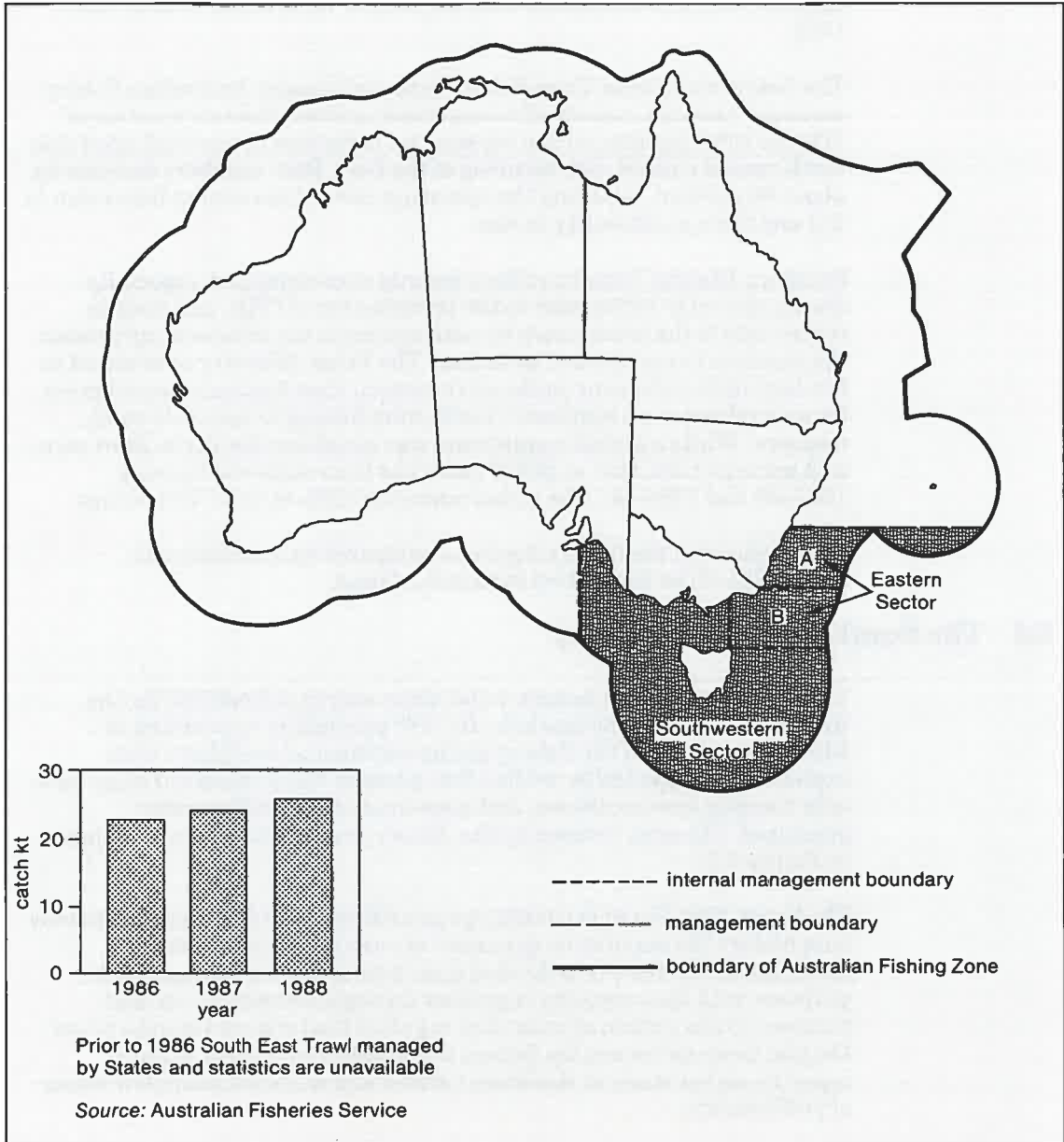
6.3 The South East Trawl fishery

The South East Trawl fishery is the major source of fresh fish for the Sydney and Melbourne markets. In 1988 production was valued at \$40 million. Parts of the fishery on the continental shelf have been exploited since the 1920s, while other parts on the continental slope have only recently been exploited, and some areas may still be underdeveloped. The area covered by the fishery and recent catches are shown in Figure 6.3.

The South East Trawl is a multi-species fishery, and despite its relatively long history the population dynamics of most species are poorly understood. The fishery is divided into three zones for management purposes with fleet capacity regulated through restrictions on boat numbers and a system of units that regulate boat size and engine power. Despite these measures the fishery has substantial excess fishing capacity, either static or declining catches and in recent years low levels of profitability.

In addition to the above measures a total allowable catch has been set for the gemfish sector of the fishery. Gemfish migrate north each year in large schools, during which time they are heavily exploited and particular concern is held for gemfish stocks. A total allowable catch of 3 kt was set for this species for each of the 1988 and 1989 seasons. The 1989 total allowable catch was allocated to qualified fishermen as individual quotas that may be leased to other quota holders. This has addressed the biological problem, but has not brought about any long term adjustment of capacity in the fishery. If the administrative arrangements for monitoring the 1989 quotas prove successful high priority will be given to introducing transferable quotas. However, the existing input controls could constrain the effectiveness of ITQs in achieving the autonomous adjustment of the fishing fleet.

Figure 6.3
The South East Trawl fishery



Although the South East Trawl fishery is almost exclusively in waters under Commonwealth control, it is not subject to an agreement with the States under the Offshore Constitutional Settlement that would allow it to be managed totally under Commonwealth law. One result of this is that each State still requires fishermen to be licensed by that State before fish can be landed and sold. The South East Trawl Management Advisory Committee has a large and varied membership, including representatives from the fishing authorities of four States. Its effectiveness has been limited, largely because of the unwillingness of various groups to compromise on their sectional interests and to seek solutions that would be in the best long term interests of the fishery as a whole.

6.4 The Orange Roughy fishery

Orange roughy is a deep water species which has been found in Australian waters extending at least from waters off New South Wales to the western part of the Great Australian Bight, thus overlapping the South East Trawl fishery. Orange roughy is an example of a 'new' resource which has significantly expanded a fishery in which access rights have already been allocated.

To give an indication of the potential value of orange roughy, an aggregation discovered in the Great Australian Bight in February 1989 was fished by 23 boats, and a total of 2.5 kt valued at \$5 million was taken over 12 weeks — 90 per cent within the first 6 weeks. Another large aggregation was discovered off St Helens on the Tasmanian east coast in late May 1989. This fishery was temporarily closed on 9 August 1989 to enable the information gathered to that date to be assessed. At the time, some 30 boats were operating and had taken an estimated 15 kt valued at \$30 million to fishermen. Reports indicated that in the denser parts of this aggregation fish were entering the nets at a rate of a tonne per second.

For most of the year orange roughy are sparsely spread over large areas of deeper water off southern Australia, but periodically large numbers aggregate for relatively short periods. Such aggregations may reform several times before finally dispersing.

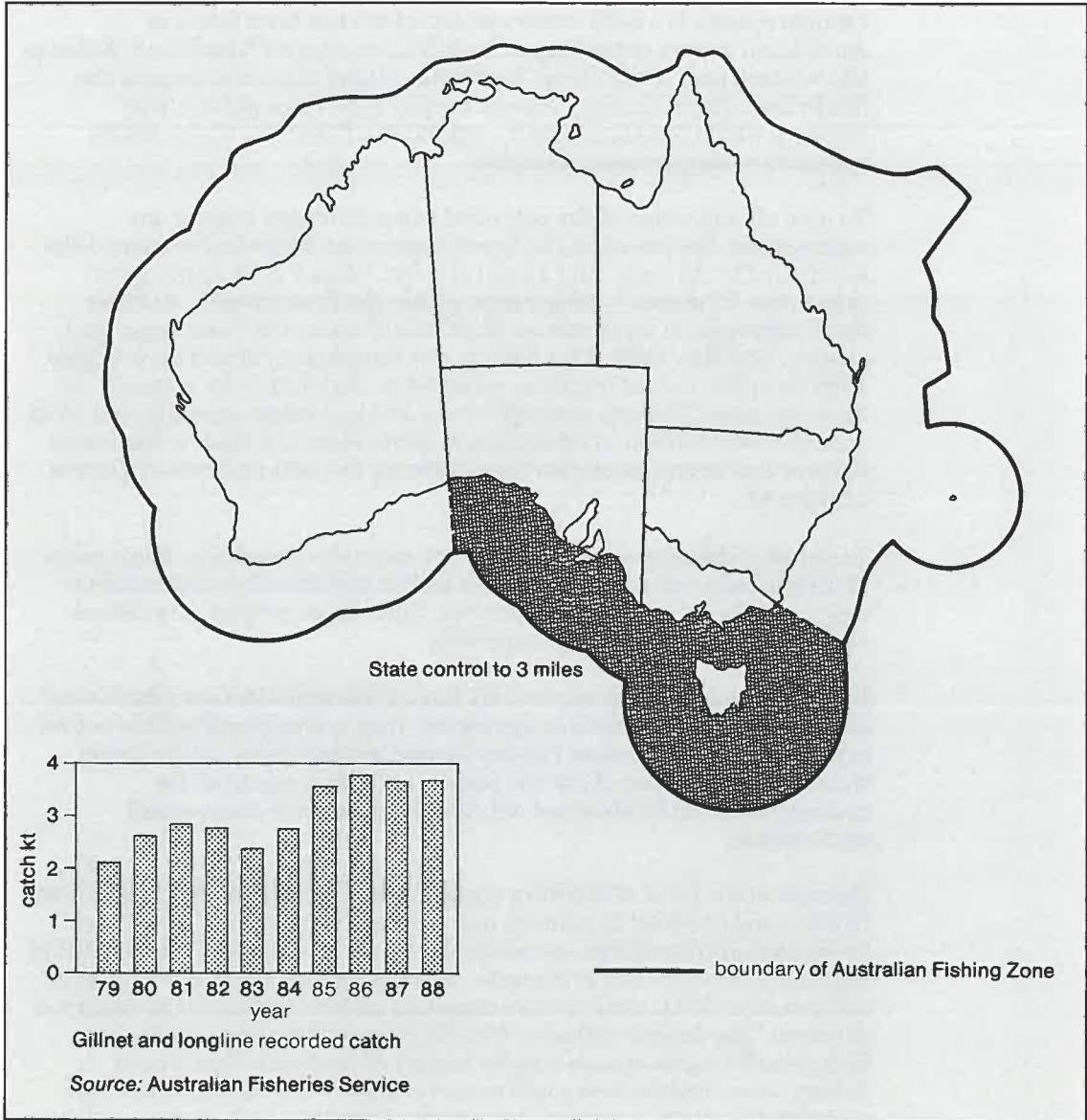
Because orange roughy apparently have a low reproduction rate, a very slow growth rate and tend to aggregate, they are very susceptible to over-exploitation and therefore require careful management. At the same time, the information about the resource which is essential for management can be obtained only as a by-product of commercial exploitation.

Because of the level of catching capacity already in the South East Trawl fishery, and the need to manage orange roughy on an individual stock basis, exploitation of this species in the South East Trawl fishery is being regulated through output controls, initially an annual total quota set at conservative levels until a more complete understanding of the fishery is obtained. The danger is that by treating the potentially valuable yet biologically fragile orange roughy as part of the South East Trawl fishery, over-exploitation could occur because of the fishing effort that could be directed to orange roughy stocks from the excess fishing capacity now in the South East Trawl fishery.

6.5 The Southern Shark fishery

The Southern Shark fishery, valued at \$20 million in 1988, extends from eastern Victoria to a line extending south from the western boundary of South Australia including waters around Tasmania, as shown by Figure 6.4. The annual catch from the fishery has been on an upward trend through the 1980s. Fishermen operating in this fishery exploit two main species, the school shark and gummy shark, using mainly demersal gillnets and longlines. As sharks are long lived and produce few young, the fishery is susceptible to over-exploitation.

Figure 6.4
The Southern Shark fishery



Despite biological evidence of declining stocks, catches have not yet started to fall, and fishermen remain unconvinced of the serious biological threat that existing levels of fishing effort pose for the fishery.

The States manage the fishery in State territorial waters while the fishery outside State territorial waters is managed by the Commonwealth. The Commonwealth has introduced limited entry and gear restrictions to that part of the gillnet sector of the fishery under its control, but at present it does not regulate the longline sector.

Current management arrangements which are aimed at biological conservation do not provide a satisfactory means of controlling effort throughout the fishery, because all longlining activities and gillnetting in State waters remain uncontrolled. Furthermore, that sector of the fishery which is subject to Commonwealth management (that is, demersal gillnetting more than three nautical miles offshore) still has substantial excess fishing capacity even though management controls have reduced net numbers. While not reducing total fishing effort the restrictions on the number of nets have imposed significant inefficiencies on the fishermen involved.

Management of the fishery is further complicated because most boats also operate in the rock lobster and/or scallop fisheries, each of which is subject to quite different Offshore Constitutional Settlement arrangements. Because of these jurisdictional problems any solutions to the management problems in this fishery will require a coordinated approach by the Commonwealth and States. This issue is further discussed in Chapter 7.

6.6 Conclusions

Each of the fisheries considered in this chapter has excessive levels of fishing capacity (over-investment) and unnecessary levels of fishing effort. This has depleted stocks to the point where continuing current levels of fishing effort in the Southern Bluefin Tuna, the Southern Shark and the South East Trawl fisheries will continue the decline in stocks. It has also wasted potential resource rents in the Northern Prawn, the Southern Shark and the South East Trawl fisheries. The introduction of individual transferable quotas in the Southern Bluefin Tuna fishery should ensure that any resource rents that are generated are not dissipated in this fishery.

The Government believes that fisheries management must now place much greater emphasis on preventing wastage of economic resources and ensuring that exploitation does not endanger the future viability of fisheries resources. It sees the existing levels of excess fishing capacity as the major obstacle to achieving management objectives in most fisheries.

An adjustment scheme has been introduced into the Northern Prawn fishery to buy back units of capacity from fishermen, as have surrender provisions for the Northern Prawn, the Southern Shark and the South East Trawl fisheries. Section 7.2 discusses these mechanisms further. However, the pace of adjustment likely to be achieved by these measures is unacceptably slow and the final outcome uncertain.

The Government believes that there is a role for it to actively assist the fishing industry to reduce over-capacity. The form of this assistance will vary with the fishery concerned. It may take the form of Government funding or guarantees for a buy-back arrangement, it may involve assistance towards establishment costs of an ITQ system, or it may take the form of direct assistance for those fishermen choosing to leave a fishery, somewhat similar to the assistance which the Government makes available through the Rural Adjustment Scheme to farmers choosing to sell their farms.

The Government is conscious that the fisheries considered in this chapter, as well as other Australian fisheries, involve the exploitation of lucrative community owned resources, yet no charge is imposed on the fishermen exploiting these resources for the preferential rights granted to them. The Government has therefore decided that while it will provide assistance with the restructuring of fisheries, the fishing industry must accept the imposition of charges that will result in those granted preferential rights making appropriate payments for those rights.

Except in the Southern Bluefin Tuna fishery where individual transferable quotas are the management control used, there is a high degree of Government intervention, and the management controls limit the incentives for fishermen to become more efficient. It is the Government's objective in managing fisheries to develop controls which provide incentives for efficiency rather than constraints on efficiency. This means that wherever possible the controls introduced should allow market forces to play a major role in investment decisions. The Government believes that the advantages of individual transferable quotas are significant and they will be the preferred form of management control unless it can be shown that other forms of management are more effective or cost efficient.

7. Issues in Commonwealth Fisheries Management

Key initiatives

- While the Offshore Constitutional Settlement has greatly assisted in rationalising Commonwealth and State jurisdiction for fisheries management, some of the arrangements, particularly off south eastern Australia need review.
- A specialist task force is to be established to examine the need for structural adjustment on a fishery by fishery basis:
 - the Government will consider financial support for structural adjustment if it can be shown that the benefits exceed the cost. The Government will also collect a significant share of the resource rents resulting from the restructuring on behalf of the community as owner of the resource.
- The Government will continue its involvement in international fisheries fora, particularly those relevant to the South Pacific and other areas where shared stocks are exploited.
- The Government will ensure that the interests of traditional aboriginal and islander fishermen are adequately protected.
- The existing Commonwealth Fishing Boat Licence will be replaced with fishery specific licences.

The general directions for Commonwealth fisheries management policies laid down in the preceding chapters require some issues in Commonwealth fisheries management to be addressed. In some cases these are broad issues, such as future directions for the Offshore Constitutional Settlement (OCS) arrangements with the States, or means for achieving structural adjustment in fisheries with excess capacity. In other cases they are more specific issues — for example, Australian participation in international fora dealing with highly migratory species such as tuna, aboriginal and islander fishing or the appropriateness of current licensing and surveillance operations.

This chapter addresses these diverse issues and identifies the initiatives which the Government will take in order to make fisheries management more effective.

7.1 The Offshore Constitutional Settlement

While the OCS has generally added to the effective management of Australian fisheries its success in different fisheries has been far from uniform. One feature of its implementation is the limited use made of Commonwealth-State joint authorities. Only three joint authorities have been established — one with Western Australia for the shark

fishery, one with the Northern Territory for pearling and one with Queensland for Article 22 fisheries under the Torres Strait Treaty in the area of Australian jurisdiction in the Torres Strait Protected Zone.

The main reason why joint authorities have not been used for major fisheries is that they tend to be administratively cumbersome and tend to perpetuate the problems of divided responsibility even though the single jurisdiction and associated licensing arrangements could be beneficial. Where it is possible to give responsibility to either a single State or the Commonwealth this has been done because of the obvious advantages over a joint authority.

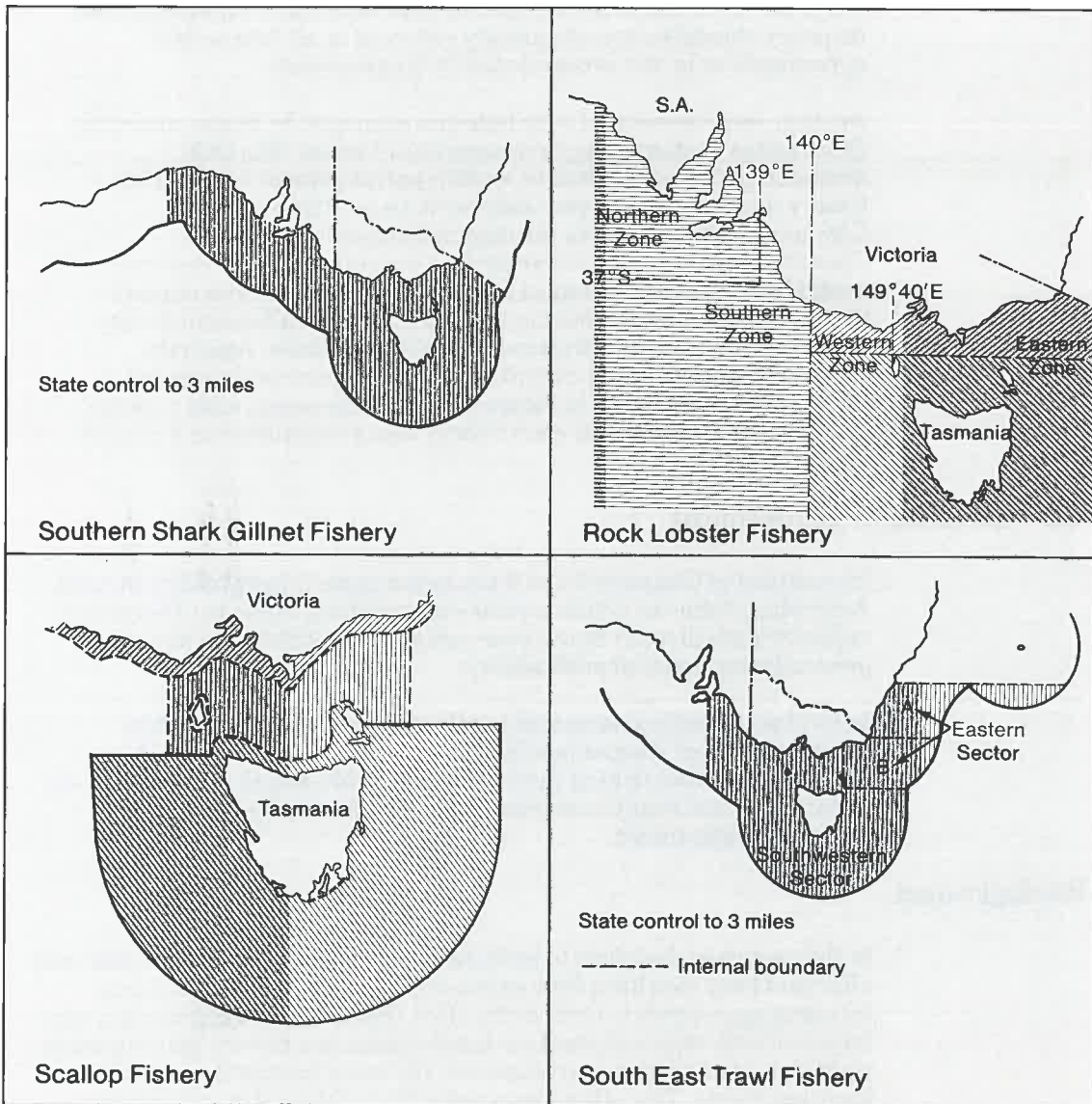
However, even where fisheries have been managed under Commonwealth law, States have remained involved through management advisory committees (notably in the South East Trawl and the Southern Shark fisheries). These committees have perpetuated to a large extent all the disadvantages of divided responsibility.

While the *Fisheries Amendment Act 1980* made provision for a South Eastern Fisheries Joint Authority consisting of the Commonwealth Minister and appropriate Ministers from New South Wales, Victoria, South Australia and Tasmania, such a joint authority has not been established. Figure 7.1 indicates the alternative arrangements that have been made for the Rock Lobster, Scallop, Shark and South East Trawl fisheries. As mentioned in Chapter 6 there is a particularly close link between the Rock Lobster, Scallop and Shark fisheries as most fishermen have rights to at least two of these fisheries. Indeed, to most fishermen these are not separate fisheries but one complex fishery which they fish in accordance with seasonal, catch and market conditions. Attempting to manage the resources as separate fisheries means that problems such as excess capacity that are common to the whole complex are being tackled in a piecemeal way and measures that are necessary for good management of one fishery cannot be implemented because of possible flow-on effects in the other fisheries.

The Government proposes to review the arrangements in the south-eastern area of the Australian Fishing Zone to determine whether the existing arrangements are the best way of meeting the overall management needs of the fisheries and of the fishermen involved.

The introduction of OCS arrangements has not significantly reduced the overall number of licences held by fishermen. As discussed in section 7.5 the number of Commonwealth Fishing Boat Licences is still three times greater than the number of boats operating in Commonwealth managed fisheries. Most fishermen operating in Commonwealth managed fisheries continue to hold State licences. Some of this duplication is necessary in situations where boats are authorised to fish in two or more fisheries, and some occurs because of the apparent reluctance on the part of fishermen to forgo licences they have held for some time but no longer require. It is also of concern that some States insist that fishermen hold State licences before they can land and market fish taken either on the basis of a Commonwealth Fishing Boat Licence or a licence issued in another State. The Commonwealth will raise this matter at the next Australian Fisheries Council meeting, with a view to reducing unnecessary regulation and impediments to trade.

Figure 7.1
Fishery boundaries in South Eastern Australia under OCS



Source: Australian Fisheries Service

This policy statement announces policy changes which the Government considers will remove excess fishing capacity from existing Commonwealth managed fisheries. Many of the fisheries for which management responsibility has been passed from the Commonwealth to the States under the OCS also have substantial excess capacity resulting in the loss of very significant resource rents. The Commonwealth urges the States to reduce the excess fishing capacity in all fisheries under their control as the opportunity cost to their regional fishing industries of misallocated resources is significant.

While not proposing to renegotiate existing OCS arrangements to force the States to adopt similar management objectives to those set out in this statement, the Commonwealth does intend to ensure that its policy objectives are adequately reflected in all future OCS agreements or in any renegotiated OCS agreements.

Another issue associated with fisheries managed by States under the OCS relates to sharing any resource rental levies. The OCS arrangements are an effective working arrangement for dividing fishery management responsibilities between the States and Commonwealth, but these arrangements do not change the Constitutional rights of either party. Consequently, any resource rental levies paid with respect to State managed fisheries outside State territorial waters belong to the whole Australian community rather than to only the citizens of the adjacent State. Again the Commonwealth does not intend to seek retrospective change but it will address this matter in future OCS arrangements, with revenue sharing arrangements for each fishery being negotiated on a case by case basis.

7.2 Structural adjustment

As outlined in Chapters 3 and 6 the major underlying problem in most Australian fisheries is substantial excess fishing capacity. This excess capacity leads directly to the over-exploitation of fisheries and to generally low levels of profitability.

Individual transferable quotas are the only management control currently used in Australian fisheries that promotes automatic adjustment within fishing fleets. Input controls, which are used in most fisheries, do not result in market forces automatically generating structural adjustment.

Background

In the past most decisions to limit entry to a fishery have been made only after problems resulting from excess capacity were already evident. Introducing controls to limit entry often results in many fishermen who have had only minimal previous involvement in a fishery gaining entry rights based on historic participation, the basis frequently used for granting access. This often aggravates the problem of excess fishing capacity.

Continued technological innovation also can aggravate the problem. If the fleet size is not reduced, improved technology that has been adopted by fishermen cannot be fully utilised and when the new capacity is added to existing over-capacity the result is usually further 'regulated inefficiency'.

While it is generally recognised that excess fishing capacity exists in most fisheries, to date attempts to rectify the situation have usually avoided the difficult task of imposing conditions which will stop some fishermen from continuing in the fishery. Instead there have often been penalties imposed on those wishing to perform some action like replacing boats or transferring their fishing rights. For example, in the South East Trawl and Northern Prawn fisheries fishermen must surrender a proportion of their fishing units before they can replace boats.

Buy-back schemes

The only significant structural adjustment program currently operating in a Commonwealth managed fishery is the voluntary adjustment (buy-back) scheme in the Northern Prawn fishery. This scheme, together with the boat replacement surrender provisions, has reduced the potential fleet size since 1985 by 70 boats to 230.

A significant problem that the voluntary adjustment scheme has highlighted is the difficulty of selling surplus fishing boats. The demand for Northern Prawn fishery boats in other Australian fisheries is limited because of input restrictions in those fisheries and because most of the boats are not suitable (due to their size) for use in developing fisheries. Export opportunities for these boats have also proved limited.

Because there can be a significant difference in the value of a boat in the fishery for which it was built and its value when used for some other purpose, for boat owners to be willing to withdraw their boats from a fishery they need to be compensated for the value of fishing access rights they are relinquishing and the loss incurred if the boat has to be sold outside the fishery. However, because fishing boats are depreciating assets with finite economic lives, the cost of any restructuring program can be reduced if boats are allowed to wear out first and compensation paid only for fishing rights. Consequently, when determining the optimum rate for restructuring a fishery, fisheries managers need to weigh all the costs of removing fishing boats against all the benefits resulting from reducing the number of boats in the fishery. Costs such as the lower opportunity cost of the alternative use of the boats, need to be weighed against the benefits from lower total maintenance and running costs in the fishery because of the reduced number of boats. This optimum rate of restructuring is likely to vary considerably from fishery to fishery.

Surrender options

Not all fishery restructuring schemes require fishing rights to be bought back. In some fisheries — for example, the Torres Strait Prawn fishery (where all fishermen also hold a Queensland East Coast Trawl licence and many hold Northern Prawn fishery units) — fishing rights to the Torres Strait fishery have been made non-transferable. If the remainder of the package of access rights is transferred the non-transferable right must be surrendered. In these cases it is the individual wishing to transfer fishing licences who must bear the full cost. It should also be noted that this type of provision can be effective only when the value of the right being surrendered is a small part of the total value of the package of fishing rights.

Compensation is also unnecessary when the impact of restructuring programs on all fishermen is in proportion to the fishing rights they hold. The impact is proportional when a total allowable catch, distributed among fishermen as proportional ITQs, is reduced. It is also proportional if, in a fishery managed through input controls, inputs such as gear units are reduced by a fixed proportion. If the units are transferable fishermen wanting to use the same quantity of gear as they did previously could do so by buying gear units from those prepared to leave the fishery, in much the same way as ITQ units are traded. There is less flexibility in proportionately reducing units based on boat size or engine power as fishermen, left with fewer units than are needed for an existing boat would have to stop fishing.

If fishermen exploit a fishery to achieve its maximum economic yield, they maximise resource rent and maximise the total market value of their fishing access rights. Therefore, if excess fishing capacity is reduced towards that level needed to take the maximum economic yield, the total value of fishing rights will increase. If the reduction of fishing capacity is proportional, each fisherman will hold the same proportion of total fishing capacity before and after the reduction. As resource rent increases, each fisherman's share of the rent will increase. Clearly in this case it would not be necessary, or appropriate, for the Government to pay compensation for the reduction in capacity.

In Chapter 3 resource rent dissipation in the fishing industry was examined as was the justification for charging fishermen an appropriate amount for the right to exploit a community resource for private gain. The Government may therefore be prepared to contribute to the cost of restructuring fisheries in order to increase resource rent, on the understanding that the increase is reflected in the amounts paid by fishermen for the right to exploit a community owned resource.

Social impact

While the economic advantages of reducing excessive fishing capacity were identified in Chapter 3, the possible social impact of reducing the number of persons engaged in the fishing industry also needs comment.

For individual fishermen, restructuring that involves the Government in a buy-back of fishing access rights provides a cash benefit to the owner of those rights. However, for crews the situation is not quite so clear. In most fisheries a large proportion of crews are itinerant workers and provided the restructuring is effected over a reasonable period experienced workers should have little difficulty in retaining employment.

Although the fishing industry is a significant employer in many coastal communities there are very few Australian regional communities that rely totally on the fishing industry. Nevertheless, any restructuring of the fishing industry will have an impact on these communities. However, any adverse financial impact of adjustment on regional communities would be mitigated by the cash received from the sale of access rights by those leaving the industry, the higher incomes received by the fishermen remaining in the industry, and the non-fishing sources of income in most regional economies. Any impact would also be minimised if the restructuring were gradual.

Flow-on effects

A major issue associated with structural adjustment is the impact that fleet reduction in one fishery could have on other fisheries, particularly where boats are authorised to operate in more than one fishery. It is important to ensure that in addressing the problem of excess capacity in one fishery flow-on effects are minimised. In recognition of this the Australian Fisheries Council, as part of its 'licence splitting' policy, has a requirement that no surrender of access rights to one fishery can occur without the consent of the managers of other fisheries to which fishing rights are also held.

However, this approach effectively allows the managers of a fishery in which the problems of excess capacity are not being effectively dealt with to frustrate attempts to restructure associated fisheries. While the Government acknowledges that the preferred option would be for the managers of both fisheries to work towards solving the common problem, it considers that ultimately the managers of each fishery must be allowed to take those decisions necessary for the proper management of the fishery for which they have responsibility. If this has flow-on effects to other fisheries it is in these other fisheries that these effects must be addressed.

Taskforce

The Government recognises that solving the problem of excess fishing capacity is central to developing an efficient fishing industry, capable of making its proper contribution to the national economy. It also recognises that the adjustment mechanisms now in place in fisheries not amenable to management through individual transferable quotas are not capable of achieving the required restructuring within a reasonable time or at a reasonable cost. The Government is therefore going to establish a task force of specialists to examine and make recommendations on structural adjustment in Commonwealth managed fisheries on a fishery by fishery basis. The task force will also consider appropriate methods of collecting charges from the industry once the restructuring takes effect and profits start to increase. The task force will include members from the Australian Fisheries Service, the Australian Bureau of Agricultural and Resource Economics, the Department of Finance and/or Treasury, and representatives from the appropriate management advisory committee.

7.3 Australia's international fisheries responsibilities

Issues in international fishing relations stem from Australia's involvement in managing highly migratory species that travel through the Australian Fishing Zone; the activities of Australian boats fishing outside that zone, especially those operating within the exclusive economic zones of other nations; and Australia's regional role in the South Pacific.

The management of highly migratory species

Under the Law of the Sea, Australia is required to cooperate in managing highly migratory species of fish with other countries through whose waters the fish also travel.

Australia's obligation relates particularly to the Southern Bluefin and East Coast Tuna fisheries. There is a brief description of the Southern Bluefin Tuna fishery in section 6.2. The East Coast Tuna fishery is dominated by yellowfin tuna which are thought to originate from two separate stocks, one in the Coral Sea and one in the South Pacific.

Both fisheries are fished by domestic fleets, and because the stocks originate outside the Australian Fishing Zone Australia takes a strong interest in tuna fishing activities in the Indian Ocean and the South Pacific. Australia contributes to the international management of these fisheries through two main fora:

- the Indian Ocean Fishery Commission and the Indo-Pacific Fishery Commission are subsidiary organisations of the United Nations Food and Agriculture Organisation. Australia is a member of the tuna management committees of both subsidiary organisations. The Indian Ocean Tuna Management Committee has recommended an Indian Ocean Tuna Commission be established to manage the tuna fisheries of the Indian Ocean; and
- the South Pacific Forum Fisheries Agency reports to the Forum Fisheries Committee and the South Pacific Forum. Australia provides aid to the South Pacific Forum Fisheries Agency to assist in fisheries management and in operational aspects such as surveillance. Direct input into management is also achieved through participation in regional meetings.

Australia will continue to protect domestic fishing interests through its involvement in the Indian Ocean Fishery Commission and the South Pacific Forum Fisheries Agency and, through these fora, provide assistance in the management of highly migratory species throughout the region.

International fishing by Australian boats

As fishing technology in Australia increases and as domestic management arrangements encourage larger boats to move into developing fisheries offshore, Australian fishermen are travelling outside the Australian Fishing Zone to fish for tuna and other species. In particular, they are moving into the South Pacific and into waters north of Australia.

This has implications on two fronts. First, the Government wants to ensure that South Pacific tuna stocks are managed to prevent over-exploitation. Second, Australia places great importance on its relations with other nations, particularly those in South-East Asia and the South Pacific. The Government therefore encourages Australian fishermen to adopt a responsible and cooperative attitude to the various national fisheries authorities of the regions.

Australia's role in the South Pacific

Australia, together with other South Pacific nations, is party to a multilateral access agreement which allows US tuna boats uniform restricted access to the national fishing zones of all participating countries. Thus the agreement aims to regulate US fishing for tuna in the south-west Pacific. Australia's participation in the agreement is linked to its overall responsibilities in the South Pacific and the great importance the Australian Government places on its relationship with the island nations.

Australia will continue to work with South Pacific nations and other nations in the region to develop management strategies to protect marine resources and to increase the economic benefits that accrue through the use of those resources.

7.4 Aboriginal and Torres Strait Islander fishing

Most of the interaction between commercial and traditional fishing within the Australian Fishing Zone occurs in Torres Strait. All fishing in this area — traditional and commercial — is managed under the *Torres Strait Fisheries Act 1984* by the Torres Strait Protected Zone Joint Authority. This joint authority comprises the Commonwealth Minister for Primary Industries and Energy as chairperson and the Queensland Minister for Primary Industries.

The management objectives in the Torres Strait Fisheries Act differ significantly from those in the *Fisheries Act 1952*. The Torres Strait Act gives effect to Australia's fisheries obligations under the Torres Strait Treaty with Papua New Guinea and ensures that the rights and obligations conferred on Australia by that Treaty are given effect and in particular that the way of life and livelihood of the traditional inhabitants, including their rights in relation to traditional fishing, are safeguarded. Under the Treaty, the right to traditional fishing takes precedence over other forms of fishing. The Government does not propose to make any changes to these arrangements.

In other fisheries managed by the Commonwealth, traditional fishermen have usually not interacted very much with commercial fishermen. Their interaction has usually been in inshore fisheries managed by the States. However, should there be future interaction between traditional and commercial fishermen in Commonwealth managed fisheries, the Government will ensure that the interests of the traditional fishermen are adequately protected.

7.5 Licensing

Commonwealth Fishing Boat Licences

Commonwealth Fishing Boat Licences have been issued to fishermen operating in Australian proclaimed waters since the passing of the Fisheries Act in 1952. From the outset they were issued by the States on behalf of the Commonwealth Government to anyone who had a boat and applied for a licence. The cost was nominal and each licence had a one year tenure enabling the holder to operate in all proclaimed waters. The licences were introduced when the Australian fishing industry was growing rapidly and they provided a way of monitoring this growth and identifying those involved.

Since 1963, more and more fisheries have been managed through limited entry. Such management programs have involved closing fisheries by issuing fishery notices and then endorsing the licences of those permitted to fish exempting them from the notices.

The introduction of the Offshore Constitutional Settlement and management plans to the major fisheries for which the Commonwealth has responsibility has meant that an unendorsed Commonwealth Fishing Boat Licence serves no purpose in managed fisheries. However, the right conferred by such licences to fish in all areas or fisheries not closed by fishery notices does present difficulties for developing new fisheries in an orderly manner.

Concern at the continued growth in the number of Commonwealth Fishing Boat Licences despite growing evidence that most major fisheries were approaching full exploitation led to a freeze on the issue of new licences in 1985. Because this freeze does not contain provisions covering boat replacement, fishermen are able to 'transfer' a licence from a small boat to a much larger one. As a result, a market for such licences developed, with prices as high as \$30 000 being reported.

It was expected that once the Offshore Constitutional Settlement was introduced those who operated only in State managed fisheries would no longer take out Commonwealth Fishing Boat Licences. However, this did not occur to any significant extent and in 1988 there were over 4200 such licences although only about 1500 were endorsed to operate in Commonwealth managed fisheries.

Fishing licences that give access to all waters are quite contrary to the current management needs of the Australian fishing industry, which is management on a fishery by fishery basis. The Government, therefore, intends to replace existing Commonwealth Fishing Boat Licences with fishery specific licences which will permit fishing only in fisheries designated on the licence.

Master Fisherman's Licences

The Fisheries Act currently requires each master fisherman to be licensed. In 1988, there were 5600 Master Fisherman's Licences issued. Under the Fisheries Act fishermen do not have to meet specific qualifications to be eligible for such licences. Competency and seamanship qualifications are determined under the maritime laws of the different States.

The principal justification for issuing these licences is that they enable the person in charge of a boat to be identified if an offence under the Fisheries Act is committed. However, any number of persons on a boat may hold such a licence. The Government intends to review the present Master Fisherman's Licence in consultation with the States and the fishing industry to see how it should be changed to make it more effective and relevant.

7.6 Surveillance

The aim of surveillance in Commonwealth fisheries is to prevent unauthorised operations in the Australian Fishing Zone. There are two principal tasks — the offshore surveillance of foreign fishing and the inshore surveillance of domestic fishing. The surveillance program of Australian fishing boats involves State fisheries agencies and the Northern Territory and Tasmanian police, which collectively undertake domestic fisheries surveillance on behalf of the Commonwealth. Surveillance of foreign fishing is conducted in conjunction with the defence forces and Coastwatch, a coastal surveillance agency.

Offshore operations typically involve monitoring licensed foreign fishing boats, apprehending unauthorised fishermen and providing a deterrent to unlicensed fishermen close to the Australian Fishing Zone. Foreign fishing surveillance programs have targeted high risk areas and, through Coastwatch, ensure aerial and surface surveillance platforms are

available to meet the surveillance and enforcement objectives of the Commonwealth.

Surveillance of domestic fishing operations has in recent years been brought under the ambit of formal fisheries management plans. As a result, fisheries managers have had a high level of consultation with industry and State fisheries authorities on surveillance programming, costs and priorities.

The Government recognises that its implementation of a 'beneficiary pays' policy has created special problems with respect to surveillance. Fishermen in some fisheries acknowledge the need for surveillance and have worked with managers to develop cost-effective surveillance arrangements, bringing about substantial cost savings. In other fisheries, however, fishermen have demanded unrealistic reductions in surveillance activity — reductions which would, in the view of managers, threaten the viability of the whole management structure.

The Government is currently considering a consultant's report on the adequacy of the existing surveillance arrangements. The Government will use this report to ensure that future surveillance operations for Commonwealth fisheries are cost effective and consistent with the policy and administrative changes set out in this statement.

8. Information and Research for Fisheries Management

Key aspects

- Research expenditure should be directed toward areas likely to provide the highest level of benefit and the beneficiaries should contribute to costs in proportion to the benefits received.
- Fishery managers will be responsible for setting the priorities and administering the resultant research projects for management related research.
- Commonwealth funding for fisheries research is to be made more effective:
 - unmatched Commonwealth funding for the Fishing Industry Research and Development Trust Fund is to be reduced from 1.0 per cent of the gross value of fisheries production to 0.5 per cent, with the shortfall to be made up from research levies to be collected from the fishing and aquaculture industries. The Commonwealth will match industry contributions up to 0.25 per cent of the gross value of fisheries production;
 - management related research in Commonwealth fisheries is to be primarily funded by direct industry levies, supplemented by Commonwealth funding when necessary;
 - the existing funding arrangements of the Fisheries Development Trust Account are to be phased out; and
 - the roles of the Australian Bureau of Agricultural and Resource Economics and the Bureau of Rural Resources in relation to fisheries research are to be enhanced, with additional funding for the two bureaux if necessary.
- The relevance of fisheries research and its application to management will be enhanced by improving communication between researchers, fisheries managers and the industry.

Fisheries management involves setting limits on the exploitation of fish stocks. Chapter 3 indicated that there are a number of controls which can be imposed — the two most commonly used being some form of output restriction (through a total allowable catch) and some form of input restriction. Regardless of how limits are imposed, the decision to impose them is taken because available information indicates that management objectives will not be achieved in their absence. Fisheries managers make decisions regarding the management approach to be used on the basis of many sources of information, including commercial and recreational fishermen, industry groups, and scientific and economic research.

8.1 Current fisheries research funding arrangements

There are at present four mechanisms administered by the Department of Primary Industries and Energy for funding fisheries research.

The Fishing Industry Research and Development Trust Fund (FIRDTF) supports a wide range of fisheries research. The research funds are allocated by the Fishing Industry Research and Development Council (FIRDC) and are used to fund a wide variety of research projects including a significant number that benefit only State managed fisheries. The total expenditure through the Fund was \$6.8 million in 1988–89 and is expected to be about \$7.5 million in 1989–90. The Commonwealth Government provides all of these funds, and in doing so matches expenditure from approved State fishing research funds up to a maximum of 1 per cent of the gross value of fisheries production. (The State fishing research funds are generally financed by industry levies.)

The Fisheries Development Trust Account has provided funds for a range of exploratory and developmental research projects. It is a small program (\$0.3 million in 1988–89), financed solely by the Commonwealth Government, and is intended for funding one-off urgent projects.

Special research levies have been collected for management related research projects for some specific fisheries such as the Northern Prawn and East Coast Tuna fisheries. Fishermen in these fisheries contribute to the cost of these programs — approximately \$0.4 million being collected in 1988–89. These contributions do not attract matching grants to the Fishing Industry Research and Development Trust Fund.

The Torres Strait Research and Monitoring Program was established to fulfil Australia's obligations under the Torres Strait Treaty. It focuses on the research needs of traditional fisheries in the region. Funding under this program was \$0.6 million in 1988–89.

As well as administering the fisheries research funds, the Department has two bureaux conducting research relevant to fisheries — the Australian Bureau of Agricultural and Resource Economics (ABARE) and the Bureau of Rural Resources (BRR). ABARE has a specialist unit of economists who undertake research relevant to the fishing industry. Their research has contributed significantly to the Government's management policies for the Northern Prawn, Southern Bluefin Tuna and South East Trawl fisheries. The BRR provides high level scientific advice to the Minister and to the Australian Fisheries Service to assist them in managing Commonwealth fisheries. While BRR undertakes some research, its main role is to review and analyse research carried out by other agencies such as CSIRO, State fisheries research agencies and, to a lesser extent, universities. It also facilitates communication between the Australian Fisheries Service and the research organisations.

The Government also funds applied fisheries research through CSIRO. In 1988–89 the Government provided CSIRO with \$9 million for fisheries research through Commonwealth appropriations. Approximately \$2 million of these funds was allocated specifically for research related to the management of the Australian Fishing Zone.

State Governments undertake a considerable amount of fisheries research, which the Australian Bureau of Statistics has estimated to have cost about \$33 million in 1986–87. This expenditure includes contributions from both the industry and State Governments — about one-third coming from the industry and two-thirds from State Governments. Higher education institutions also undertake a small amount of fisheries research, estimated to have cost about \$1.3 million in 1986.

8.2 A synopsis of the Government statement *Research, Innovation and Competitiveness*

In May 1989 the Government released a package of Ministerial statements which comprehensively addressed research and development issues across a number of portfolios. Part of that package was a statement produced by the Minister for Primary Industries and Energy and the Minister for Resources titled *Research, Innovation and Competitiveness*. This document outlined the important principles which underlie government involvement in research in the primary industry and energy sectors of the economy and proposed some administrative changes to improve the conduct of research.

There are three important points which are relevant for fisheries research:

- research is like any other form of investment and should be undertaken only when it is likely to yield benefits which exceed its costs;
- the industry should contribute to the funding of research in direct proportion to the benefits it receives. That is, a beneficiary-pays principle should apply; and
- there is a strong case for government involvement in fisheries research because the government has the responsibility of effectively and efficiently managing fisheries on behalf of the community so as to ensure both profitable exploitation and protection of the resource. The Government also has a role in funding research not directly related to fisheries management because of the benefits to society generally from such research. While there are no definitive cost-benefit studies on fisheries research, similar studies for agricultural research have shown that there are significant external benefits to society.

The research statement foreshadowed a reconsideration of some aspects of fisheries research in this policy statement.

8.3 Cost effectiveness of research

A major issue and one that the Government believes has received insufficient attention in the past is the cost effectiveness of fisheries research. There are circumstances in which expensive scientific research may not be warranted. Analytical techniques such as cost-benefit analysis are available for assessing the likely economic benefits of particular research projects, and while these have some problems, they provide the only rigorous way of assessing research projects before they

are undertaken. Cost-benefit analysis can also be used with past research, where both the costs incurred and benefits derived are more readily identifiable. By conducting retrospective investigations it should be possible to determine the types of research and the research organisations that have, and have not, provided the best returns for research investment.

In the *Research, Innovation and Competitiveness* statement the Government announced that ABARE would undertake a program of studies to evaluate research and development in order to improve the basis for decisions on research priorities and expenditure. Studies of wool textile research and aluminium research are currently under way, and the Government believes that a study of the benefits obtainable from fisheries research would be most worthwhile. Accordingly the Government will encourage FIRDC to provide funding to ABARE to undertake such a study.

8.4 Research to assist Commonwealth fisheries management

Part II of this statement deals with the administrative arrangements for fisheries management. The Government believes that there is scope to improve the current administrative arrangements and that the future changes will benefit the industry and the community. Because of the changes to the administration of fisheries management the remainder of this chapter does not refer to the Australian Fisheries Service, but to the Commonwealth's fisheries management organisation.

For most fisheries a long period of study supported by intensive fishing effort is required before there is anything approaching a complete understanding of the factors determining variability in the resource. However, in many newly developed fisheries and in several well established fisheries, the effects of intense fishing pressure on fish stocks necessitates management action long before a rigorous theoretical model of a fishery is available. Because of this fisheries managers are frequently in a position where they must make decisions with respect to the future of fisheries even though the information available to them is incomplete. If they fail to make such decisions the long term viability of fisheries may be put at risk. For the information base to be as complete as possible, managers have to be able to direct the research effort to address the questions they consider to be most important — questions which are relevant to clearly stated fisheries management objectives.

The Government accepts that fishery managers need to be able to establish the priorities for fisheries research which is of direct relevance to management (tactical research) and to be able to administer the resulting research projects. In undertaking these tasks, managers will need to call on the expertise of biologists and economists whose knowledge will be essential in advising on the feasibility of different research projects and on the appropriate research agency to undertake the work.

8.5 Future fisheries research funding

The Government is proposing some administrative changes to improve current arrangements for allocating funds for different types of fisheries research. In particular, the Government sees merit in simplifying and

clarifying the mechanisms through which management related research is undertaken. It does not intend to change the total level of Commonwealth funding for fisheries research. The changed funding arrangements will affect FIRDTF and the FDTA programs, while the fisheries specific research programs funded by the industry will be significantly expanded. The Torres Strait Research and Monitoring Program will not be affected by these changes.

The Government statement *Research, Innovation and Competitiveness* discussed the rationale underlying the Government's contribution to research funding in some detail and concluded that the most appropriate approach for this portfolio's rural and related industries was for the Government to match industry research contributions up to a ceiling of 0.5 per cent of the gross value of production for the industry concerned.

In that statement the Government also acknowledged that where it has the responsibility for managing natural resources on behalf of the community there is a case for government funding which is independent of industry contributions. In view of this, the Government has decided to provide unmatched funding for fisheries research through FIRDTF equal to 0.5 per cent of the gross value of Australian fisheries production.

The Government considers that both the fishing and aquaculture industries, as major beneficiaries of fisheries research, should also contribute to the cost of that research. To encourage these industries to directly contribute to FIRDTF research funding the Commonwealth is also prepared to match industry funding to FIRDTF up to 0.25 per cent of the gross value of fisheries production. This will be additional to the unmatched funding of 0.5 per cent of gross value of fisheries production referred to above. If the industry contributes 0.25 per cent (or more), the total government contribution will be 0.75 per cent, and the total value of FIRDTF funding will remain at (or exceed) its present level of 1.0 per cent of the gross value of fisheries production.

As all Australian fishermen benefit from research funded from FIRDTF, the Government believes that industry contributions should be collected from all fishermen regardless of whether they operate in State or Commonwealth managed fisheries. Furthermore, because the aquaculture industry, although under the jurisdiction of the States, also benefits significantly from FIRDTF funded research, the Government believes that it ought to contribute to FIRDTF. The Government will therefore initiate discussions with State fisheries authorities and with the industries concerned to develop an equitable system for collecting research contributions from fishermen in State managed fisheries and from the aquaculture industry.

The Government's general policy will be to require research which is directly management related and specific to a fishery to be funded by those entitled to operate in that fishery, in proportion to the benefits received. The Government recognises that in some cases — for example, developing fisheries — this approach may not generate sufficient funds to enable adequate research to be undertaken. Because of this the Government will also provide limited research funds for the Commonwealth fisheries management organisation. That organisation will be required to put forward proposals in its annual operating plan which set out anticipated research needs for the forthcoming year and the two ensuing years. These proposals will outline the nature and benefits of

the research to be funded, the extent of industry contributions, and any reasons why supplementary funding from the Government is necessary. This will ensure that research funds are allocated efficiently and on a planned basis, and will enable managers to plan research over a three year period.

In recognition of the importance of communication with the industry and of the increasing public interest in fisheries matters, the Government believes that BRR and ABARE should play a central role in providing accurate public assessments on the status of various fish stocks and of fisheries management programs. This role will be an important aspect of the new administrative arrangements for fisheries management discussed in Part II of this statement. The Government believes that there will be increased demands on ABARE and BRR, and while the full cost of their management related research will be recovered, it is likely that they will also be required to undertake (or commission) research in the public interest. This will require additional funding, and the Government will ensure that funds are available to supplement the resources of these two bureaux.

In keeping with its intention that there should be no net effect on research funding as a result of these changes, the Government's additional expenditure to supplement industry contributions for management related research in Commonwealth fisheries, and its additional allocations to BRR and ABARE, will be approximately 0.25 per cent of the gross value of fisheries production. The allocation of funds for these different purposes will be at the discretion of the Minister.

The FDTA funding program will be discontinued when its current research projects are finished, since its functions will be subsumed under these new funding arrangements.

The new arrangements will commence at the same time as the new administrative arrangements discussed in Part II. The Government will review the funding arrangements for fisheries research after three years of operation in order to assess whether any further changes are needed.

8.6 Future role of different research organisations

Australian Bureau of Agricultural and Resource Economics

ABARE has an important dual role in fisheries research. It will provide contractual research services to FIRDC or the fisheries management organisation, and will conduct research which is in the public interest. As part of its public interest research, it will publish discussion papers and reports about the likely economic impact of various policy options with respect to the management of fisheries. ABARE will also be the Minister's chief source of advice on the economic aspects of fisheries research.

The objectives for fisheries management as outlined in this statement place a much greater emphasis on economic considerations than in the past. This must inevitably increase the role and responsibilities of ABARE in fisheries management. The role of ABARE will be:

- to examine existing fisheries management programs to determine how well they are achieving the Government's objectives;

- to evaluate the economic impact of proposed new management plans and changes to existing management strategies;
- to provide advice on the most appropriate method of imposing charges for resource use and the appropriate level of such charges;
- to develop techniques for assessing the level of economic benefits from fisheries research both in past programs and in proposals; and
- to assist in determining the priorities of future management related research.

Bureau of Rural Resources

The BRR's role in fisheries management related tasks will be enhanced under the proposed new administrative arrangements. In a similar fashion to ABARE, the BRR will also have dual research responsibilities. Its major tasks in the area of fisheries management will be:

- to act as scientific advisor to the Minister and, as required, the Commonwealth's fisheries management organisation on fisheries resources and environment issues. In undertaking this task the BRR will collect biological information relevant to fisheries management and analyse it to provide unbiased and objective advice;
- to monitor the stock position of designated fish species and produce an annual report on stock assessments for those species. This will require it to undertake, and wherever possible publish, reviews of research undertaken by other agencies. However, it may also need to undertake interpretative work on stock assessments and/or commission special research to enable it to fulfil its monitoring and advisory roles;
- to assist fishery managers in determining priorities for management-related biological research and, if requested, to review progress in projects funded against these priorities;
- to monitor and provide scientific information and advice on environmental and technological issues relevant to fisheries resources in order to ensure the maintenance of sustainable fisheries; and
- to provide, if requested, research on a contractual basis to assist management programs.

The future roles of ABARE and BRR are also referred to in Part II of this statement, where changes to the current administrative arrangements for Commonwealth fisheries are proposed.

CSIRO Division of Fisheries

The Government recognises the very valuable contribution which the CSIRO Division of Fisheries makes to fisheries research. The Government is aware of the major contribution CSIRO has made to fisheries management, particularly through its input into various scientific advisory committees. The Government sees a continuing major

role for CSIRO, in consultation with BRR, in advising on fisheries research priorities.

As indicated previously CSIRO receives specific funding for research to support fisheries management in the Australian Fishing Zone. The Government believes that these funds should continue to be made available for CSIRO research but that the organisation responsible for fisheries management should be more involved in determining their allocation to competing research priorities.

The Fishing Industry Research and Development Council

The Fishing Industry Research and Development Council has similar functions to the research and development corporations for other industries within the Department's portfolio. These corporations have expertise-based boards with charters to establish priorities, select projects meeting these priorities, and to actively solicit research to fill gaps in research effort. They are expected to forge close links with Australia-wide research agencies and ensure that results of research are widely disseminated and that there is minimal duplication of research effort.

The Fishing Industry Research and Development Trust Fund, whose future funding arrangements were discussed in section 8.5, will be used to finance research of general benefit to the fishing industry, including basic or high risk research and research required to assist the Government in its overall responsibilities for managing the marine environment. However, FIRDTF will not be the primary source of research funds for specific management related research — that is, research which yields a high proportion of benefits to identifiable fisheries, either Commonwealth or State managed — unless it is quite clear that such research has wider interest and that the benefits are likely to be of value throughout the industry or the community.

With regard to the question of whether FIRDC should become a research and development corporation, the Government noted in the *Research, Innovation and Competitiveness* statement that when FIRDC was established (in August 1988) its objectives had many similarities to the objectives associated with establishment of a research and development corporation — namely, increased flexibility and greater autonomy from government. In that statement the Government indicated that it would give consideration to the prospect of achieving further administrative benefits by changing FIRDC into a research and development corporation, following consultation with the States and relevant bodies. The Government will undertake these consultations before the end of the present Council's term.

Scientific advisory committees

Most Commonwealth fisheries are presently served by a scientific advisory committee, research group or research committee. Many of these committees have been set up under the Standing Committee on Fisheries and formally consist of representatives from the BRR, which also usually provides the secretariat; CSIRO and State fisheries research agencies. Only the tuna and pearl fisheries are not served by such scientific committees. The scientific advisory committees do not deal with economic issues.

These committees are designed to provide a forum for critically reviewing research results, including those leading to advice to fisheries managers, reviewing research in progress and recommending priorities for biological research. Since many of the scientific committees advise management advisory committees on the status of fish stocks, these management advisory committees frequently refer specific management related questions to the scientific committees.

In general the Government considers that the scientific committees are working well and provide a valuable forum for the critical and timely review of biological advice for fishery managers. The Government intends that the BRR continue its strong support of the scientific committees for Commonwealth fisheries. In the majority of cases, the BRR should continue to provide the chairperson and secretariat for each scientific committee.

8.7 The role of the logbook program

Logbooks are a primary source of data on catch and fishing effort in most Commonwealth managed fisheries. They typically record date, area fished, fishing undertaken, gear used and catch taken. Data from logbooks are used not only by managers but also by biologists and economists conducting research into the fishing industry. Logbook data aggregated to give area and seasonal patterns are also useful to fishermen in planning fishing strategies. Under the cost recovery arrangements the industry meets 90 per cent of the cost of the logbook program for selected fisheries.

The validity of logbook data depends on the commitment which fishermen have to complete their logbooks accurately. It is essential that fishermen appreciate the importance of providing good data in their records, and it is in the interests of managers and researchers to develop a close liaison with fishermen and to provide good feedback of how their data are used. If the quality of logbook data is maintained, management information and scientific field research can present a more complete picture of a fishery.

In order to validate the accuracy of logbook returns it is essential that they be checked against some other information source, although in some cases this may be difficult to do. Catch information from logbooks should, where possible, be validated against commercial landings.

While logbooks can be expected to remain the prime data collection method in most fisheries there may be some fisheries in which some other form of data collection system may be preferred because of relative costs. In determining whether logbooks or some other system should be used the factors to be considered include the capacity of each system to provide necessary data, the availability of alternatives, such as the records of buyers or processors, and the relative costs and effectiveness of the various options.

The Government believes that since the Commonwealth fisheries management organisation has ultimate responsibility for the successful management of fisheries and for providing a cost effective data system it should be responsible for logbook collections and for the associated industry liaison and encouragement to provide valid, reliable data. As

part of this responsibility the management organisation should also have the responsibility of ensuring that researchers are given complete and open access to the data contained in the logbooks. The Government also believes that the other users of logbook information — researchers and fishermen — should have an input into the design of the logbooks.

A matter of continuing concern to fishermen is the possible use of information provided in logbooks in prosecutions under the Fisheries Act. While in no way condoning any action contrary to the Act the Government's policy is not to initiate a prosecution on the basis of logbook information.

8.8 Communications

Researchers and fishery managers as well as the industry gain from exchanging information, as fishermen have a wealth of direct sea experience and routinely operate in a wider range of areas than do research vessels. As already indicated, research results and logbook data are an important source of information, and communication of research results in an easily understood manner is vital.

At present the results of research are published in a variety of scientific and technical journals. The results are communicated to the fishing industry and the wider community on a national basis through publications such as *Australian Fisheries*, and at a local level through State journals.

However, there is little feedback to fishermen on the response of fishery managers to the results of research and there is little explanation of how data obtained from fishermen are used in research. The industry is sceptical of biologists and economists who produce lengthy reports expressed in unfamiliar terminology, particularly if the use of the data they provide is not clearly apparent.

Fishery managers, biologists and economists should join forces to improve the communication of research results to all involved in the industry. Of course communication is a two way process, and the industry must be prepared to accept the message which is presented to them. Managers should continue to produce documents in plain English which can be easily absorbed by fishermen and the general community, while the BRR and ABARE should continue to present their results at management advisory committee meetings and in other discussions with industry such as regional workshops. Researchers from other institutions outside ABARE and the BRR should also be encouraged to increase their communication with the industry.

8.9 Summary

Research expenditure is a form of investment, and like any other investment, should be undertaken only when the expected economic benefits exceed the costs involved. Because of this, research expenditure should be directed to those areas likely to provide the highest level of benefit. Studies of the cost effectiveness of past research can provide some guidance about the likely benefits of future research.

The Government considers that the beneficiaries of research should contribute to research costs in proportion to the benefits they receive. Thus if both the fishing industry and the community benefit from fisheries research the contribution by the industry and government (on behalf of the community) should reflect the relative benefits received.

Because of the importance of research findings to effective fisheries management the Government considers that fisheries managers need to be able to determine research priorities for management related research.

The Government will maintain its present level of fisheries research funding but there will be changes as to how these funds are allocated. FIRDTF will receive Commonwealth funding up to 0.5 per cent of the gross value of fisheries production on an unmatched basis. Additional funding to match contributions from the fishing and aquaculture industries will also be provided on a dollar for dollar basis up to a ceiling of 0.25 per cent of the gross value of fisheries production. Provided that those industries make this relatively modest contribution the funding base for FIRDTF will remain at its current level.

Approximately 0.25 per cent of the gross value of fisheries production will also be provided by the Government for research undertaken outside FIRDTF. These funds will be distributed to the fisheries management organisation to supplement industry contributions to management related research, and to the BRR and ABARE to fund their additional public interest fisheries research.

The Government believes that the relevance of fisheries research and its practical application can be enhanced if communication links between researchers, fishery managers and the industry are improved.

9. Fisheries and the Environment

Key interactions

- Fisheries are part of a complex marine ecosystem and the Government recognises its responsibilities for conserving and protecting the marine environment.
- The Resource Assessment Commission is to examine the issue of coastal zone management and the Fisheries Pollution Committee will continue its research and reporting on pollution in the marine environment.
- The environmental implications of driftnet fishing have led to severe restrictions on this activity in the Australian Fishing Zone and a call by Australia for a global ban on driftnet fishing. In addition, the Government believes the industry should actively encourage its members to adopt fishing practices which minimise by-catches.
- The fishing industry has a responsibility to adopt environmentally sound practices both for its long term viability and in the interests of the community.

Environmental protection goes hand in hand with fisheries management. Fisheries, as part of a complex marine ecosystem, can be affected by a wide variety of external influences. For fisheries to be healthy and productive their aquatic environment must also be healthy and productive. Man-made impacts on the environment can affect the quantity and the quality of fish caught, and so have the potential to damage or destroy commercial fisheries.

The Government recognises that it has significant responsibilities for conserving and protecting the marine environment. This is reflected in legislation and also arises from international obligations associated with the United Nations Convention on the Law of the Sea. The Government has already made clear its commitment for such protection in its recent environmental policy statement *Our Country, Our Future*.

Protection of the marine environment and biologically prudent fisheries management go beyond ensuring the continued productivity of major commercial fisheries. The full range of marine ecosystems must be protected so as to maintain biological food chains and associated habitats and to ensure continued biodiversity. The Government also recognises the need to protect the habitats of endangered species and, where necessary, to modify commercial fishing practices to protect those species. In this respect the Government's aim is to maintain the populations of individual species at levels consistent with continued genetic diversity within each species and not simply survival of a few specimens of each.

Of course it is very much in the longer term interests of the Australian fishing industry to ensure that Australia's marine environment is adequately protected. Therefore the industry must also act responsibly to ensure that marine resources are protected.

9.1 Government initiatives to protect the marine environment

Because one of the objectives of fisheries management is to ensure the biological sustainability of the resource, an important task of a fisheries manager is to take account of environmental impacts on, and arising from, fisheries management. As is evident from this statement, the Government places a high priority on ensuring that the marine environment is adequately protected. The Government will ensure that all fisheries management decisions which are made on behalf of the Commonwealth are consistent with the provisions of the *Environment Protection (Impact of Proposals) Act, 1974*.

The Government has already taken a number of steps which will protect the marine environment.

The Resource Assessment Commission

One of the most important environmental undertakings of the Government, in recognition of the need to have an established procedure to resolve complex competing claims for the use of major public resources, has been the establishment early in 1989 of the Resource Assessment Commission.

Underpinning the establishment of the Commission is the belief that only through the integration of conservation and development will equitable decisions be made about resource use. By establishing the Commission the Government has made it clear that it is no longer acceptable to look at economic issues without taking into account all relevant environmental issues. Nor is it acceptable to pursue environmental goals without looking at the economic and social consequences.

The Resource Assessment Commission provides a means of addressing some important environmental problems facing fisheries. It recognises the need for balance between developmental and environmental objectives, and is one avenue through which the needs of fisheries management can be taken into account when considering development proposals.

Development of the coastal zone provides an example of a situation where the impact of one industry can threaten the viability of another, or where development has serious consequences for conservation. Many commercial marine species — prawns, for example — live in coastal habitats. Coastal development which affects water quality or which destroys or damages estuaries, mangroves, bays, reefs or seagrass beds therefore poses a major threat to these marine species as well as other species higher up the food chain.

Although administrative responsibility for virtually all coastal development rests with the States (except in the Great Barrier Reef Marine Park where the Commonwealth has substantial and in some

cases over-riding management responsibilities), because of the significance of coastal zone development for the environment and the industries involved, the Government has decided to refer coastal zone management issues to the Resource Assessment Commission. This initiative was announced in the recent environmental policy statement. The Government will consult with the States and Territories and other interested parties on the terms of reference for this inquiry.

The Government has also given an undertaking to establish a National Working Group on Coastal Management with representatives of all levels of government, industry and community groups, to facilitate dialogue on coastal zone issues.

Consultation and collaboration

Environmental responsibilities rest collectively with State, Northern Territory and Commonwealth Governments. The Commonwealth Government sees Ministerial Councils as the main avenue for consultations on environmental policies affecting specific industries. In the recent environment statement the Government also announced that it has proposed to the States and Northern Territory that a consultative group be established to consider environmental and developmental issues in a broader and more integrated way. Such consultations would facilitate joint studies and a national approach to the management of the environment.

Information sharing

The effectiveness of the Resource Assessment Commission will be in large part dependent on the ability of existing organisations (State, Commonwealth, and private) to provide the range of economic and environmental data necessary to provide well informed advice. In order to provide support to the Resource Assessment Commission the National Resource Information Centre has recently been established within the Department of Primary Industries and Energy and funding has been made available for an environmental resources information network within the environment portfolio. As these data systems develop, the body of information available to fishery managers will be updated and improved.

Controlling and monitoring pollution

Like coastal development, pollution has the potential to affect the quantity and quality of fisheries resources available for harvesting. Pollution is already a major concern of the fishing industry and the Commonwealth Government. The possible impact of pollution on the fishing industry was an important issue when, for example, the proposal for the Wesley Vale pulp mill was being considered.

The scientific aspects of pollution in the marine environment are addressed by the Fisheries Pollution Committee, which is a technical committee reporting to the Standing Committee on Fisheries. In addition, the Government is also actively considering bringing the fishing industry within the scope of the National Residue Survey. It will hold discussions with State Governments and the fishing and aquaculture industries in the near future with a view to establishing a

pilot survey and determining appropriate funding arrangements. The pilot survey will provide a useful basis for assessing the need for, and nature of, future action on marine pollution.

In recognition of the growing awareness of the effects of pollution on fisheries, the Australian Fisheries Council recently endorsed the appointment of a chemical liaison officer within the Bureau of Rural Resources. This officer will be jointly funded by the Commonwealth and the States. The officer will monitor the distribution and effects of chemicals in the Australian marine environment and oversee developments in the regulation, use and distribution of chemicals potentially harmful to fisheries resources and aquaculture.

Pollution affecting the marine environment may be either land based or sea based. Land based pollution includes pesticide and fertiliser runoff from agricultural land via inland waterways; industrial effluent and sewage discharged into these waterways or directly into the sea; and persistent debris, particularly plastic, which finds its way into the sea by various means. Sea based pollution has sources such as ocean dumping, ocean incineration of toxic wastes, oil spills, and biologically destructive anti-foulant paints used on boat hulls (such as tri-butyl tin).

The Commonwealth Government controls ocean dumping through the *Environment Protection (Sea Dumping) Act 1981* and the *Environment Protection (Sea Dumping) Amendment Act 1986*. These Acts protect the marine environment in the Australian Fishing Zone by regulating the loading, dumping and incineration of wastes and other matter at sea and prohibit the dumping of radioactive waste or other radioactive matter into Australian waters. They enable Australia to fulfil its international obligations under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, otherwise known as the London Dumping Convention, the South Pacific Nuclear Free Zone Treaty and the articles referring to sea dumping in the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region. The Acts apply to all ships in Australian waters and to all Australian ships and aircraft in any part of the world.

The *Environment Protection (Sea Dumping) Act 1981* and its Amendment Act, however, control only a small part of the total amount of material dumped into the sea. The Act does not control products, such as sewage and industrial waste, which may be dumped through ocean outfall schemes under the control of State or local authorities.

It is difficult to obtain comprehensive information on current pollution levels in the coastal environment, largely because legislation has divided the responsibilities for controlling coastal development and the disposal of waste at sea. In an endeavour to resolve this issue the Commonwealth Government has raised with the Australian and New Zealand Environment Council (ANZEC) the need to develop national water quality standards. The Government hopes that this will lead to the adoption of consistent national standards for water quality.

The Government considers that the Fisheries Pollution Committee is the appropriate body to take the first step in overcoming this lack of information — by gathering information about the total effluent load being discharged into the oceans in the Australian coastal zone — since it already comprises representatives of both Commonwealth and State

Governments. The Government will ensure that the information gathered is stored on the National Resource Information Centre database. This will allow the data to be used in conjunction with other natural resource information, including data that the Bureau of Rural Resources is assembling about the geographical distribution of major fisheries species (known as the 'fisheries resources atlas'), which is to be stored on the Centre's database.

The progress of the Fisheries Pollution Committee in this monitoring task will be reported to the Australian and New Zealand Environment Council which has general policy responsibility for pollution issues. The membership of the Fisheries Pollution Committee will be reviewed to ensure it contains appropriate environmental representation.

Heard and McDonald Islands

The Government will ensure that there are no adverse effects from commercial fishing in the sub-Antarctic environment of those waters of the Australian Fishing Zone surrounding Heard and McDonald Islands. Exploratory and commercial fishing will be permitted only if it can be shown to be consistent with the protection of this fragile environment.

Assessing the risk of introduced diseases

Recent experience in the North Sea and the North Atlantic indicates that pollutants — notably polychlorinated biphenyls (PCBs) — predispose marine animals to disease by weakening their immune systems. In addition, diseases which kill or otherwise affect marine life can be introduced into the marine environment through ocean outfalls of untreated sewage or from the bilge or ballast water of international vessels.

At this stage, such pollutants have not reached serious levels in the Australian Fishing Zone. However, the Zone will need to be monitored closely to avoid such problems. The pumping of ballast water is believed to have introduced species of toxic dinoflagellates, seaweed and possibly small fish to Australian waters. Introductions such as these are likely to reduce the quality or quantity of commercial fish species, alter the marine habitat and could introduce disease. The Department of Primary Industries and Energy is currently reviewing the risks involved with ballast water discharge, possible technical solutions, and the likely economic impact of any recommended action.

Controlling driftnet fishing

The recent environment policy statement pointed out the alarming expansion in driftnet fishing by distant water fishing fleets and the threat this posed to the future of marine resources and the communities which depend on them. Using driftnets indiscriminately can rapidly deplete targeted fish stocks and result in unacceptable levels of by-catch (non-targeted species) including marine mammals and other forms of aquatic life. Because of this, Australia will press for a global ban on driftnet operations.

Fisheries legislation has been effective within the Australian Fishing Zone in deterring driftnet operations and in denying support to foreign

driftnet vessels. In 1986 the Government introduced stringent controls on the length of driftnets in northern Australian waters. Since then no foreign driftnet vessels have operated in Australian waters. The existing restrictions on the use of driftnets in the Australian Fishing Zone will be maintained.

The Government has extended the restrictions on net length to the whole of the Australian Fishing Zone and will continue to deny foreign driftnet vessels access to Australian ports, except in cases of emergency. It will also prevent transshipment within the Australian Fishing Zone of fish caught using driftnets.

Additional aspects of the Environment Statement

The Prime Minister's Environment Statement included a range of commitments which add to the Government's intention to protect the marine environment. With Australia's ratification of the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region, and its impending implementation, Australia will have significant international obligations with respect to marine water quality, pollution control, living marine resource management and coastal protection. The Australian and New Zealand Environment Council is addressing the domestic implications of this Convention. In addition, the Government will pursue protection of the marine environment by implementing commitments on the protection of biological diversity, endangered species, the national strategy to ensure all ecosystems are represented in a reserve network, the development of a national greenhouse strategy and in other international environmental arrangements.

9.2 Responsibilities of the industry

The fishing industry has both a responsibility and an incentive to minimise the impact which its activities have on the marine environment. Its responsibility stems from the need to preserve the environment for future generations, while the incentive arises because an ecosystem which is conserved and protected will be more productive than one which is neglected or degraded.

While there is such an incentive for the fishing industry in a collective sense, it has to be acknowledged that some individuals will succumb to cost cutting through the adoption of environmentally dangerous or destructive practices. In some cases the Government can directly control industry practices to prevent damage to the environment, as in the case of driftnets referred to previously, but in other cases it is more appropriate for the industry to develop codes of practice and to put pressure on its members to adopt these practices. The two examples below are both areas in which the Government believes the industry should develop and enforce codes of practice.

By-catches

Most fishing activity will result in some by-catches. By-catches of particular concern include species under biological threat. In some cases, better targeting or the use of avoidance devices could possibly reduce the problem of by-catches.

The most common by-catches in the commercial fisheries of the Australian Fishing Zone are species for which no markets exist. Because they lack direct commercial value little attention has been paid to the

effect that fishing pressure has on their stock levels or on the food chain that may ultimately affect commercially valuable species. The Government believes that the industry should actively encourage its members to adopt fishing practices which will minimise by-catches.

Marine debris

The increasing use of the ocean for fishing and leisure pursuits is contributing to the accumulation of debris in the marine environment — often objects made from materials which are not readily biodegradable. The loss or dumping of fishing gear, particularly monofilament nets, introduces the potential for such gear to continue fishing ('ghost fishing') for prolonged periods, depleting both target and non-target species. The Government believes that industry should actively discourage its members from discarding used fishing gear at sea because of the potential impact on marine life and that the industry should also take steps to minimise the likelihood of losing such gear at sea. Similarly, at sea disposal of any persistent debris, particularly plastics, should be avoided because of the demonstrated harmful effects of such debris on marine life of all types but particularly turtles, marine mammals such as dolphins and seals, and sea birds.

9.3 Aquaculture

The Australian aquaculture industry commenced last century with the culture of Sydney rock oysters. This remains one of the few truly successful aquaculture species for Australia. To date, major successes with aquaculture in Australia have been restricted largely to the bivalves (oysters, pearls, mussels, giant clams) and fish (trout, Atlantic salmon). Crustaceans have not yet proven their profitability in Australian aquaculture.

The Commonwealth Government has very limited legislative responsibility with respect to the development and operation of aquaculture in Australia. Matters such as aquaculture sites and the environmental impact of aquaculture are largely under the jurisdiction of State Governments.

It must, however, be recognised that environmental pollution can affect aquaculture as well as wild fish stocks. The chances of aquaculture being viable is therefore highest where pollution and environmental degradation are minimised. It is also important to ensure that aquaculture projects themselves do not have adverse environmental impacts. It is preferable when establishing an aquaculture project to, for example, reclaim already cleared land rather than destroy additional areas of mangroves.

In many respects the links between aquaculture and management and research in other fisheries are tenuous, especially when the species being raised are exotics such as Atlantic salmon. The most tangible links occur in the area of biological research where the life cycles of cultured species may be similar to those of wild species, and marketing. The husbanding and rearing aspects of aquaculture have no parallels in the traditional commercial fisheries.

A constant threat from aquaculture is the introduction of diseases from cultured stock to wild stocks which has occurred with severe consequences in other countries. In addition, there is the danger that cultured stocks will escape or be introduced into the wild, where some will out-compete wild stock of the same species in the short term, but may

prove insufficiently genetically diverse to survive the normal range of natural environmental conditions in the long term. Exotic species may also out-compete native species causing fundamental changes in the biological balance.

The Commonwealth Government, through the Australian Quarantine and Inspection Service, seeks to mitigate the risk of aquaculture introduced diseases through its responsibilities for exports and imports of fisheries products, including eggs, broodstock and processed output. The Fish Health Reference Laboratory of the Australian Animal Health Laboratories also plays a vital role in certifying and investigating disease conditions. The Government proposes that Commonwealth and State Governments jointly develop rigorous standards for aquaculture activities which will protect wild stocks.

The impact of pollution on a fish market

The survival, growth and reproduction of marine animals is affected by pollutants. In fisheries, pollution often results in reduced catches. Sales are also affected as an increasingly environmentally aware public avoids buying foods contaminated or thought to be contaminated by pollutants.

The effect of pollution on fish sales was obvious early in 1989 when public attention was drawn to effluent from Sydney's three sewage outlets at Malabar, Bondi and North Head. There was extensive media coverage of this issue because of concern over the possible health risks of consuming contaminated seafood. Consumer reaction was a rapid decrease in demand for all seafood in the Sydney fish market, resulting in falls in prices of at least 50 per cent and a sharp drop in returns to fishermen, retailers and restaurateurs.

The problem worsened when the State Pollution Control Commission sampled fish caught along the Sydney coastline and found levels of organochlorines, including pesticides, which significantly exceeded National Health and Medical Research Council limits. A range of heavy metal contaminants were also found in the sampled fish. In response to this information the New South Wales Government banned all fishing within 500 metres of the three sewage outlets for three months.

In an attempt to allay the public's fears about seafood contamination, the New South Wales Fish Marketing Authority advertised extensively that of all the fish sold on the Sydney market only 2 per cent were caught in the Sydney area and none was taken in the vicinity of the three sewage outlets. Fishermen from elsewhere in the State reacted by labelling their produce with its point of origin. Ultimately the New South Wales Fish Marketing Authority introduced a labelling system certifying the non-contamination of fish, while the State Pollution Control Commission and the Sydney Metropolitan Water Board began to develop a program to reduce the entry of harmful pollutants into the sea. Other States took heed of the New South Wales problem and examined ways of avoiding similar incidents in their own waters and markets.

This incident demonstrated how quickly and strongly the market responds to an actual or perceived problem. It also demonstrated that the seafood market depends on contaminant free products. Australia currently enjoys a good reputation for seafood products free from contaminants and disease but that reputation depends on Australia maintaining a healthy marine environment.

10. Recreational Fishing

Key points

- Recreational fishing is an important leisure activity for many Australians, and although its major impact is on fisheries controlled by the States it also affects some Commonwealth fisheries.
- Fisheries management needs to regulate total fishing effort, regardless of whether it is commercial or recreational, and in some fisheries this may necessitate daily catch limits for recreational fishermen.
- The Commonwealth Government will not impose a universal licence fee or levy on recreational salt water anglers, but may impose fishery specific levies on recreational fishermen if special management measures are required:
 - semi-commercial operations catering for amateur fishing activities will be required to contribute to management costs.
- Recreational fishermen will be given greater involvement in management decision making through representation on relevant management advisory committees and on the national Fishing Industry Policy Council.

Recreational fishing is one of Australia's most popular outdoor pursuits. It provides the basis for a wide range of economic activity, including the sale of fishing equipment and recreational boats, and the provision of tourist facilities. The majority of recreational fishing occurs in State managed fisheries — either in inland rivers and lakes, in bays or estuaries, or in the ocean close to the coast. However, some recreational fishing is undertaken in Commonwealth controlled fisheries, and the Government believes that it is appropriate for this policy statement to set out the Commonwealth's position on this important activity.

10.1 Participation data

A national survey conducted on behalf of the Australian Recreational and Sport Fishing Confederation in 1984 estimated that about one-third of Australia's adult population participate in recreational fishing and that expenditure on items related to recreational fishing in 1983–84 was likely to have been in excess of \$2 billion. (This study did not distinguish between salt water and fresh water recreational fishing, and included expenditure on items such as caravans, boats, camping gear, four wheel drive vehicles and road fuel in reaching its estimate of total expenditure.)

Although there is little data on the extent or value of recreational fishing in Commonwealth managed waters, the survey did find that about 13 per cent of respondents fished from boats in unprotected ocean waters (that is, not estuary or bay fishing), and a Victorian survey in 1987 found that

19 per cent of those who went fishing fished in the ocean. Clearly some of this fishing activity would have been undertaken in fisheries now under Commonwealth management.

An earlier study of recreational fishing on the Great Barrier Reef found that the recreational fishing fleet between Cape York and Rockhampton in 1980 comprised almost 15 000 boats and that there were an additional 120 charter boats engaged in game fishing. Direct annual expenditure on recreational fishing activities in that year was estimated to have been about \$34 million for the non-chartered recreational fleet and \$20 million for the charter boats — about \$100 million in 1989 dollars. An associated study of the same general area concluded that:

‘It does appear that fishing has had an effect on stocks in some areas. In the same areas it also appears that the recreational fishery makes a larger contribution to total catch than the commercial fishery and that, as in other fisheries, the majority of the catch is taken by relatively few people.’

(Craik, W in Hundloe, TJA (ed), *Fisheries Management*, Griffith University Press, Brisbane, 1986, p.196)

In more recent studies of tuna and billfish migration in waters adjacent to southern Queensland and New South Wales coasts, the BRR reported that amateur fishermen caught about 40 per cent of the tagged yellowfin tuna which were recaptured. (BRR Working Paper No. 11/89, *A biological study of east coast tunas and billfishes with particular emphasis on yellowfin tuna*, Canberra, 1989). This gives some indication of the importance which amateur sports and game fishing has for east coast fisheries.

From these rather limited studies, it can be seen that recreational fishing is an important activity both because of its economic value and because, in at least some fisheries, it can have an important impact on fish stocks. However, there is currently inadequate information about its value and impact.

The Government will investigate ways in which the database for recreational fishing can be improved. As part of this process the Government will hold discussions with the Australian Recreational and Sport Fishing Confederation with a view to possible joint funding of a study of the economic and biological impact of offshore recreational fishing.

10.2 Recreational fishing in Commonwealth fisheries

As already mentioned, the fisheries where most recreational fishing takes place are the responsibility of the States. However, game fishing and sports fishing for tuna and billfish do have a direct impact on Commonwealth fisheries, particularly those off the eastern coast of Australia, but also those off the coast of Western Australia — for example, around Port Hedland.

In order to manage tuna and billfish fisheries effectively, managers need to be able to control the impact of *all* fishing on the stocks. This may mean that management plans will have to address issues such as daily catch limits for recreational fishermen.

In other Commonwealth managed fisheries the level of amateur fishing is not so great and its impact certainly not so direct. Recreational fishermen in the South East Trawl fishery take some of the species that are fished commercially (like snapper) offshore, and some of these are also taken as juveniles in estuarine waters. Sharks exploited in the Southern Shark fishery are born mostly in estuarine waters bordering Bass Strait, and as these waters are also subject to relatively high levels of recreational fishing, there may be some impact on shark stocks.

Under the Australian Constitution, State laws apply where the Commonwealth has jurisdiction but where there is no legislative conflict. This applies to recreational fishing, for although the Commonwealth has the power to regulate such activity in waters under its control it has not, as yet, elected to do so. In its review of existing fisheries legislation foreshadowed in Chapter 4, the Government will ensure that future legislation will take into account the involvement of recreational fishermen in Commonwealth fisheries and will make provision for regulating both commercial and recreational fishermen where this is desirable for effective fisheries management.

10.3 Policy issues

Cost recovery

Recreational fishermen, like commercial fishermen, seek to harvest fish from a resource which belongs to the community at large. Traditionally, most countries have afforded individuals the right to catch fish by simple means (for example, rod and reel) for personal (non-commercial) use. However, increases in the efficiency of amateur fishing gear and the cumulative impact which a large number of anglers can have on the resource may in some instances require the introduction of management controls on recreational fishermen. For instance daily catch limits now apply to many species caught by recreational fishermen in both fresh and salt water. After all, in terms of direct impact on the resource, there is no difference between taking a fixed quantity of fish through recreational fishing or commercial fishing.

Where management controls are needed, the question of whether recreational fishermen should contribute towards the management costs of particular fisheries arises, especially where management measures and/or research programs are introduced specifically to accommodate their interests.

In considering this question, it is useful to make a conceptual distinction between two classes of recreational fishing:

- genuine amateur fishing, purely for recreation purposes; and
- semi-commercial fishing and charter boat operations.

In general, the Government believes that the beneficiaries ought to contribute to the funding of government provided services up to the point at which the contribution matches the benefits received. However, the Government recognises that it may well be administratively inefficient to impose and enforce a levy on amateur anglers who occasionally fish in Commonwealth managed fisheries. The alternative — imposing a levy or licence fee on all salt water anglers — would be easier to administer but

would be inequitable, since most of those levied would never fish in Commonwealth waters. However, if special provisions were made in a fishery to cater for the needs of amateurs and if the anglers involved could be easily identified, the Government believes that it would be appropriate for the amateur fishermen to contribute to the cost of management.

The Government believes that semi-commercial fishing operators, including charter boat operators, should contribute to the cost of managing the fisheries in which they operate.

Involvement of anglers in decision making

The task of fisheries management is not only to meet the three broad objectives identified earlier in this statement, but to do so by balancing the competing claims of different interest groups. The best way of achieving this is to involve all parties in the process of decision making. Recreational fishermen can be involved through representation on specific fisheries management advisory committees. The East Coast Tuna Management Advisory Committee (ECTUNAMAC) already makes provision for recreational fishermen.

The representatives of amateur and game fishing organisations have made a substantial contribution to the work of ECTUNAMAC. By involving both commercial and recreational fishermen in the consultative process, each group is able to gain a greater understanding of the others' concerns and the prospects for achieving practical and effective resolutions in areas of conflict are greatly enhanced.

The Government believes that bodies such as ECTUNAMAC provide a stable forum for commercial and recreational fishermen to exchange views and seek workable solutions on issues on which they differ. They also give recreational fishing groups the opportunity to discuss with managers, scientists and commercial operators broader issues such as those relating to foreign fishing access in the Australian Fishing Zone.

The Government has decided that a representative of amateur fishermen should be included in the new Fishing Industry Policy Council. The Council is to address broad issues which have a national impact and make known the views of the fishing industry to the Commonwealth Minister responsible for fisheries and to the Commonwealth's fisheries management organisation. (The administrative details of the organisation and of the Council are in Part II of this statement.) The inclusion of a recreational fishing spokesperson on the Council will enable it to take a wider perspective when considering issues and to provide more balanced advice.

Part II

Future Administrative Arrangements

11. The Most Appropriate Structure for Fisheries Administration

Key options

- There are three options for future administrative arrangements for Commonwealth fisheries management:
 - a statutory authority;
 - a division within DPIE; and
 - an office or bureau legally within DPIE, with a chief officer holding some statutory powers.
- While each has advantages and disadvantages, a statutory authority has a number of strengths, including:
 - flexibility;
 - incentives for cost effective administration;
 - less need for the Minister to become involved in day-to-day decision making;
 - a set of checks and balances arising from increased public accountability requirements; and
 - greater scope for devolution of decision making to the management advisory committees, although the board of the authority would have ultimate responsibility.

In Part I of this statement the Government set out, in a comprehensive fashion, the policy framework for Commonwealth managed fisheries in the 1990s. The framework incorporates major shifts in policy direction to further improve the management of the nation's fisheries resources. For these policies to be successful the administrative arrangements for their implementation must be the most appropriate and effective available.

The existing arrangements for administering Commonwealth fisheries have been reviewed and their appropriateness debated in recent years. The management consulting firm of Peat Marwick Hungerfords noted in their recent review of the arrangements that 'AFS has been in the forefront of fisheries development and management systems in Australia and has played an important part in the establishment of Australia as a world leader in progressive fisheries management practices' (Peat Marwick Hungerfords, *Report on the Review of Administrative Arrangements for the Management and Development of Australian Fisheries Subject to Commonwealth Jurisdiction*, Canberra, November

1988). Nevertheless, Peat Marwick Hungerfords pointed to a number of deficiencies in the present administrative arrangements and recommended that a statutory authority be established to administer Commonwealth fisheries.

11.1 Government responsibilities in fisheries management

In developing the most effective administrative arrangements for fisheries management, it is important to clarify the appropriate roles and functions of the Government and the industry in managing fisheries. The principles of fisheries management discussed in Chapter 3 play a central role in determining the functions which the Government should undertake in this area.

Conservation of the resource

Given that fisheries are a community owned resource the Government must take ultimate responsibility for ensuring that there is no biological over-exploitation and that the level of exploitation is consistent with likely demands of present and future generations. Few would question this responsibility. However, it has been argued by some that with appropriate and well defined property rights determined by the Government, the industry, acting in its own self-interest, will ensure that biological over-exploitation does not occur. While superficially attractive this argument is unlikely to be sustained in practice, for the reasons discussed in Chapter 3.

The essence of the counter argument is twofold. First, the Government has as an objective the conservation of the living marine resources and in some cases this is a constraint on economically rational exploitation. Clearly without government involvement, industry would not adopt conservation measures which constrained rational economic exploitation. Second, where economically rational exploitation is consistent with the conservation objective, property rights would not guarantee that such exploitation is achieved. The problem is that effective property rights in fisheries are difficult to establish — territorial limits are not feasible except for sedentary species, and even then poaching could be a problem. For mobile species (which make up most fisheries) individual rights to a proportion of the total catch are nearest to effective property rights. Quite apart from the administrative problems which can be associated with this type of individual quota, fishermen as a group would still have an incentive to set the total catch on which the individual quotas would be based as high as possible in order to increase all individual shares, and hence profits. The difficulties are compounded because seldom is there sufficient accurate evidence from which to determine the appropriate level of the total catch, as there is considerable uncertainty associated with the results of most fisheries research, including that involving stock assessment.

In practice, under self-regulation fishermen could well adopt rational individual strategies, for a variety of personal and financial reasons, that in total were greater than was biologically prudent. As necessary stock management decisions could lead to severe financial hardship for many fishermen, the temptation (and economic incentives) would often be to 'take a chance' that the biological advice was overly conservative or just plain wrong.

It is highly unlikely therefore that conservation objectives can be achieved without a significant degree of government involvement.

Efficient exploitation of the resource

The Government has a responsibility to ensure that the community resource is exploited in an efficient fashion. In Chapter 3 it was shown that in an open access fishery the resource rents potentially available are dissipated through unnecessary costs associated with (excessive) investment and effort. Because of this there is a strong case for government involvement in regulating access to fisheries and implementing management controls for efficient exploitation of the resource.

The Government's management controls can be implemented in various ways. The Government can be directly involved itself or the industry can be allowed to implement management plans, with the Government monitoring this activity. One major advantage of using the more indirect means is the possibility of securing a greater degree of industry commitment to the management controls. This, in turn, is likely to result in lower costs, for example with respect to enforcement. The balance between government and industry involvement will depend on the nature and extent of the problems in the fishery concerned.

Equity and social effects of resource exploitation

The Government has three broad aims with respect to equity and the social effects of managing fisheries resources:

- (i) to ensure that the controls determining access to fisheries resources are not subject to manipulation;
- (ii) to ensure that fishermen contribute to the cost of managing fisheries in proportion to the benefits they receive from that management and pay an appropriate amount for the right to exploit a community resource for private gain; and
- (iii) to take appropriate actions to relieve social impacts of adjustment in the fishing industry.

The Government believes that it needs to take responsibility for the development of policies for (i) and (ii), although the industry could play a larger role with respect to (iii).

International functions

There are a wide range of international functions with respect to fisheries policy and management which only the Government can carry out. These include negotiating bilateral, government to government, agreements for access into the Australian Fishing Zone, negotiating access for fish and fish products to the markets of other countries, and participating in multilateral fora (for example, the OECD, and FAO). While the industry can provide valuable advice to the Government, it cannot perform these functions on behalf of the Government.

11.2 Industry's role in fisheries management

Some fishermen have argued for significant changes to the administration of Commonwealth fisheries. While the discussion has at times been blurred, those arguing for a change in arrangements usually are seeking a more commercial orientation to fisheries management, and/or greater industry self-management.

What is meant by a more commercial approach to fisheries management requires clarification. Managing fisheries is *not* a commercial exercise in the normal usage of the term 'commercial'. It is in fact a regulatory exercise, providing a framework within which the private sector can undertake commercial fishing in an efficient manner. It is therefore imperative that the administrative arrangements used to implement the management controls are as efficient and effective as possible.

The proponents of self-management tend to assume (or assert) that industry *owns* the fisheries resources and hence are entitled to manage their resource. This is clearly not the case. As discussed in Chapter 3, fisheries resources are owned by the community, which the Government represents. The push toward self-management received impetus after the Australian Fisheries Service began recovering from the industry the cost of services rendered to the industry in managing fisheries — in line with general government policy. From 1989–90 onwards, 90 per cent of the attributable costs of managing selected fisheries will be met by the industry.

Under present arrangements the industry has the opportunity to examine, comment and advise on the 'attributable' costs for their particular fishery through the individual management advisory committees. Nevertheless, many in the industry wish to have greater control over the financial aspects of fisheries management if they are to be charged for the services of fisheries management.

As already indicated the Government accepts that once the terms and conditions of access to a fishery are determined, the industry has a major, direct interest in its exploitation and decisions relating to its exploitation. Therefore the industry should be involved in managing fisheries resources. From a practical viewpoint fisheries management is likely to be more effective if those most directly affected — the fishermen — can be involved in management.

The Government also believes there is a strong case for industry participation in biological assessments and decisions. Fishermen may well be able to supplement the biologists' assessments through their own observations and practical experience within fisheries and it is clearly very important that fishermen understand the reasons for conservation decisions, in order to secure their support for management.

11.3 Options for the administration of fisheries management

Although there are a number of ways in which the administration of Commonwealth fisheries management could be set up to achieve the Government functions and industry involvement identified above, there are three main options:

- a statutory authority to undertake fisheries management responsibilities in conjunction with a group in the Department of Primary Industries and Energy (DPIE) with responsibility for broad fisheries policy matters;
- a division within DPIE, as in the current Australian Fisheries Service arrangements; or
- an office (or bureau or commission), legally within DPIE but operating as autonomously as possible, with a chief officer holding some statutory powers.

Statutory authority

In recent years the Government has established clear guidelines for administrative arrangements undertaken by statutory authorities and government business enterprises. The Government's basic policy is that, where possible, government departments should be used to discharge government functions. This is designed to guard against unnecessary fragmentation of the machinery of government, to ensure consistency in structure and in relationships with the Parliament and the Government, to provide an appropriate degree of direction and scrutiny, and to ensure that there is opportunity for full and effective accountability to the Parliament and the Government.

This basic policy does not prevent statutory authorities from being used where they can be justified, but it does mean that if a statutory authority is to be established there needs to be strong justification for it.

The Government believes that there are strong arguments for establishing such an authority to manage Commonwealth fisheries.

As noted earlier, Peat Marwick Hungerfords recommended a statutory authority for managing fisheries under the Commonwealth's control. This recommendation has received considerable support from the fishing industry, although the support is by no means unanimous among fishermen. Also, what Peat Marwick Hungerfords recommended and what some sections of the fishing industry seem to view as the appropriate functions and composition of a statutory authority differ in very basic respects. In essence, although their report emphasised the perceived advantages of industry self-management, Peat Marwick Hungerfords recommended an expertise based management authority, in accordance with the Commonwealth's guidelines for statutory authorities. That is, the authority would *not* be composed of representatives of the fishing industry, but instead would be controlled by a board selected on the basis of expertise.

The Government considers that the concept of a statutory management authority as recommended by Peat Marwick Hungerfords has merit. For the reasons set out previously, the Government totally rejects the concept of the industry managing the fisheries by itself; it is simply not possible, given the Government's legitimate and vital responsibilities in fisheries management. Consequently, the type of statutory authority referred to in this statement is a mechanism through which the Government can fulfil *its* fisheries management responsibilities. There should be no misunderstanding on this point.

The structure of a statutory authority would enable the Government to effect its responsibilities in a flexible, open and less bureaucratic way. It would also allow greater community and industry participation in determining the appropriate management programs for Commonwealth fisheries than has been the case in the past.

The Minister for Primary Industries and Energy would retain ultimate responsibility for Commonwealth fisheries, but the authority would have the immediate responsibility for fisheries management and would be held accountable to the Parliament to justify its performance against statutory objectives. There could be a number of safeguards instituted to ensure that the statutory authority did not operate in a way detrimental to the public interest. These measures could also enable an authority to achieve a significant degree of industry involvement and public exposure in the decision making process:

- the authority would have a board based on expertise and not on sectional interest;
- there would be a government member on the board;
- the authority would require Ministerial approval of a three to five year corporate plan, an annual operational plan and management plans;
- it would have to provide an annual report to the Parliament;
- the Auditor General would undertake an annual audit;
- there would be public scrutiny of the authority's performance;
- the Minister would have the power to direct the board, but would be required to issue such directions in writing and publish them in the Australian Government Gazette. The statutory authority would be required to list any directions it had received from the Minister in its annual report; and
- the ultimate safeguard would be the Minister's power to dismiss the chairperson of the board, any board members or indeed the full board.

Division within DPIE

This option for managing Commonwealth fisheries is broadly similar to the current management arrangements undertaken by the Australian Fisheries Service, but has some additional measures to improve the efficiency of fisheries management. These measures include:

- delegating greater authority from the Minister to the Director of AFS;
- providing greater independence for AFS from the rest of DPIE by establishing independent personnel, financial and data processing programs (recent decisions to devolve authority within DPIE have already moved in this direction);

- establishing improved management procedures within AFS such as guidelines for both policy development and operational activities to ensure that a consistent approach is adopted throughout AFS; and
- possibly appointing an independent chairperson and secretariat for each of the different management advisory committees (this is already being implemented for the Northern Prawn Fishery Management Committee).

Office of fisheries management

Creating an office of fisheries management for fisheries administration is not a new idea, as a bureau (or office) of commercial fisheries was proposed as far back as 1927. The Peat Marwick Hungerfords report briefly discussed this option but did not consider that it would address the fundamental problems of fisheries management.

The main organisational advantage of an office over a division are the statutory powers invested in it and its perceived greater independence. In fact, in a legal sense an office would have few managerial advantages over a division, and it would still operate under the Public Service Act and report to the Secretary of the Department on those matters for which it did not have direct statutory responsibility.

An office could include a board of management with an advisory role based on expertise rather than sectional interests. The board could review all management plans, develop criteria/guidelines for management plans and other elements of fisheries policy, and participate in the development of the office's budget. However, having a board of management operating alongside an office which is formally part of a Public Service department would create some difficulties. The board would have an advisory role and it would not be appropriate for it to direct public servants who report to the Minister. However, in practice it would be difficult for the director of the office to reject the board's advice, given that the board was comprised of independent experts. There would be a very real risk of the director's authority being undermined by such an advisory board.

An office could be quite similar to either a statutory authority or a departmental division. The greater the powers vested in the office (via the statutory office holder) the more the office would approach a statutory authority. This contrasts with the constitutional position of government departments, where the statutory powers are vested in the Minister and then delegated to officials within the department, but with those powers always being exercised in the Minister's name.

If an office mechanism was adopted, the types of management improvements proposed above for the 'modified' divisional approach would also be required.

11.4 Administrative objectives

The institutional framework for fisheries management in the 1990s must provide a consistent and predictable policy environment for the industry and incentives for fisheries managers to take appropriate and difficult

decisions to maximise benefits to the nation from fishing. Accordingly, the Government has identified a number of objectives which should underlie future administrative arrangements:

- cost efficient and effective administration of fisheries management programs;
- reduced Ministerial involvement in day-to-day decision making, while retaining ultimate Ministerial responsibility;
- increased administrative flexibility;
- public accountability for decision making, operations and expenditure; and
- increased involvement of the industry in fisheries management decisions.

In the remainder of this chapter the public sector options described in section 11.3 are evaluated against these administrative objectives in order to identify which option best meets the requirements of Commonwealth fisheries management.

11.5 Cost efficiency and effectiveness

If Australia's fisheries are to be exploited in an economically efficient manner then the administration of fisheries management must also be undertaken in a cost efficient manner. For all the administrative functions that are undertaken — licensing, surveillance, logbook collections or general administration — the amounts spent should provide, at the margin, benefits which at least match the costs of undertaking that activity. Furthermore, an equivalent amount spent on a different management function should not yield a greater benefit. These are general principles which underlie the efficient allocation of inputs to any economic activity.

The Government believes that its policy of recovering the cost of fisheries management has given the fishing industry a strong incentive to keep management costs to a minimum. However, there is a danger associated with the cost recovery approach. Cost efficiency has two elements — maximising the value of output and minimising the cost of inputs. It may be relatively easy to reduce expenditure by a given amount, but if the value of output falls by more than that amount, there has been a decrease in cost efficiency. While the Government believes that industry pressure to reduce management costs is highly desirable, it is important to ensure that cost cutting does not jeopardise fisheries management objectives.

To implement a cost recovery policy where a single organisation undertakes both management and non-management functions, as would be the case for a division within a government department or for an office, the costs for the management and non-management activities would need to be separated, because the industry would only be required to contribute to management related costs. This is the situation which currently exists for the Australian Fisheries Service, which has established a system of cost recovery for 'attributable' management costs. However, because there are inevitably costs which are not clearly either management related or non-management related, there is an opportunity

for some costs to be incorrectly allocated. This could occur either because it may be difficult to assess them, or by intention if the management organisation wished to avoid the necessity of justifying further contributions from the industry.

A statutory authority which undertook *only* fisheries management responsibilities would not face the difficulty of classifying costs into attributable and non-attributable categories. All the costs of the statutory authority would be management costs and would be subject to recovery from industry. The rate of cost recovery would not necessarily be the same for all fisheries; there could, for example, be a legitimate case for the Government to pay more of the management costs in the early stages of the development of new fisheries. However, categorising management costs for developing and fully commercial fisheries would be easier (and clearer) than the current categorisation needed for attributable and non-attributable costs.

The statutory authority would require the current functions of AFS to be divided into two — those to be undertaken by the authority and those to remain within DPIE. This division of responsibility could create cost inefficiencies. To avoid these, there would need to be precisely defined functions for both the authority and the DPIE which as far as possible avoided duplication and overlap. While DPIE would have responsibility for broad fisheries policy matters, and would advise the Minister about the performance of the authority in relation to its objectives, DPIE would not monitor the activities of the authority on a day-to-day basis and would not be provided with sufficient resources to ‘shadow’ the operations of the authority. Since its functions would not be associated with the management of specific fisheries, its costs would not be recoverable from the industry.

11.6 Basis of Ministerial interaction

It is generally accepted that fisheries management is a difficult task and that it will be done more efficiently if the approach ‘letting the managers manage’ is adopted and outside intervention and direction in day-to-day matters are minimised. This could best be done using the statutory authority option. The day-to-day detail of fisheries management would become the responsibility of the executive of the authority oversighted by its board. This would allow the Minister to exercise his or her responsibility by directing overall policy and ensuring that policy objectives are met.

Of course the Minister would need to retain the ultimate responsibility for Commonwealth fisheries but, as with statutory marketing authorities, these responsibilities would be administered more through strategic means than through tactical and operational means. As noted earlier a number of safeguards could be instituted to ensure that the Minister’s responsibility to protect the public interest is met. When administration is undertaken through a government department it is more difficult for the Minister to be distanced from day-to-day decisions because of the normal pattern of interaction between the Minister and his or her department. Even if the Minister delegated some powers to the relevant departmental official (for example, the Director of the Australian Fisheries Service) the Minister would inevitably be drawn into day-to-day decision making.

Since in a legal sense an office would form part of the department, the Minister would be able to provide the same direction to an office that could be provided to a division. However, the independence of a statutory authority would require Ministerial directions to be reported in both the Australian Government Gazette and the organisation's annual report. Consequently establishing an office would not enable management and politics to be separated as effectively as they could be under a statutory authority.

However, the statutory powers conferred on the director of an office and an advisory board would give an office some independence. Furthermore, if the office was not co-located with DPIE it may be perceived to be more independent from the normal departmental controls and responsibilities than it would be in a strictly legal sense.

11.7 Administrative flexibility

It has traditionally been expected that a statutory authority would provide a more flexible administrative structure than a division of a government department. For example, Wettenhall (the consultant on statutory authorities for the Coombs Royal Commission) states that:

‘ . . . where we create SAs [statutory authorities], we intend that there will be a greater degree of managerial freedom and flexibility than in MDs [Ministerial departments]. If we do not intend this, we should vest the function in an MD, for the SA is then an inappropriate instrument.’ (Wettenhall, R. in Curnow, G. and Saunders, C. (eds), *Quangos: The Australian Experience*, Hale and Iremonger, Sydney, 1983, p.43)

However, since the enactment of the Public Service Reform legislation in 1984, there has been substantial flexibility in personnel management within the Australian Public Service. Furthermore, the Department of Primary Industries and Energy has recently been restructured to devolve considerable financial responsibilities to separate operating groups, and this has significantly increased the opportunity for administrative flexibility.

In 1987 the Government stated that:

‘Statutory authorities should be staffed under the *Public Service Act 1922* unless there are strong reasons for doing otherwise ... It will accordingly need to be convincingly demonstrated that the personnel arrangements of the Act are unsuitable before alternative methods are approved.’ (Minister for Finance, *Policy Guidelines for Commonwealth Statutory Authorities and Government Business Enterprises*, Australian Government Publishing Service, Canberra, 1987, p.13)

In view of the opportunities for flexible personnel arrangements within the Australian Public Service, the increased devolution of financial responsibilities in DPIE, and the requirement that staffing of a statutory authority be under the Public Service Act, the administrative advantages attributed to a statutory authority over a government department may well be less than Wettenhall envisaged. Nevertheless, the Government concedes that a statutory authority would have some areas of greater

administrative flexibility than either a division of a government department or an office. These areas include remuneration of the board and managing director, absence of departmental staffing restrictions and the constraints of hierarchical reporting structures, and the freedom to choose independent computing strategies without the requirement to match computing purchases with wider departmental computing strategies.

The Government recognises that if its fisheries management objectives are to be met it is essential to have high quality fisheries managers. They will need to have a good understanding of biological and economic concepts as they relate to the management of marine resources, have an in-depth understanding of the fishing industry, be able to relate easily to individual fishermen, be able to effectively conduct meetings of diverse interest groups and be prepared to take difficult and unpopular decisions in the face of opposition from the fishing industry (or other interest groups). The Government recognises that to attract and retain such persons, it may need to offer a career structure which differs in some respects from the normal structure imposed by the Public Service Act.

11.8 Public accountability

Commonwealth fisheries management in the 1990s will need to address some very complex and difficult issues. For example, decisions will need to be taken about:

- the most appropriate level of exploitation of fisheries resources to maximise present and future economic benefits, while also ensuring that the resources are biologically protected;
- development of a system of charges (including access fees) which provide sufficient incentives for commercial exploitation and an adequate return to the community for the use of community owned resources; and
- development of access arrangements, including allocation of rights to developing fisheries by competitive bidding, restructuring of management programs for existing fisheries, and assessment of foreign fishing applications.

All of these issues require difficult decisions to be made by the Commonwealth's fisheries management organisation and all the decisions will have direct financial implications for members of the industry. The question is which form of fisheries administration provides the most appropriate combination of checks and balances to provide the incentives to make these difficult decisions.

Each of the three options considered would be accountable to the Parliament through the Minister. Because of the autonomy of a statutory authority from day-to-day Ministerial control, an authority would also be accountable to the Parliament in a direct sense, as the Parliament has, through legislation, created the statutory authority to perform specific functions on its behalf. Neither a division of a department or an office would be accountable in this additional sense.

The fisheries management organisation should also be accountable to the general public, including the fishing industry. This is because the fisheries being managed are a public resource, directly affected by management decisions, and it is the fishing industry which provides a significant proportion of management funds. This form of accountability is more suited to a statutory authority form of administration than a division of a government department, or an office.

A statutory authority undertaking fisheries management would be accountable in a way similar to statutory marketing authorities, although there would be important differences. In particular, it would not be appropriate for the fisheries management authority to be subject to industry direction, as the industry's objectives may well be in conflict with the Government's overall management objectives. Instead, the authority would be required to explain the basis for its management actions, to justify the expenditure which it had undertaken, and to report to the public and the industry on the extent to which it had achieved its management objectives.

Because the authority's corporate plan, annual operational plan, fishery specific management plans, and annual reports would be public documents, the public (and the fishing industry) would have an opportunity to assess how well the authority was meeting its management objectives. The threat of public criticism for failure to meet these objectives would be a powerful incentive for the authority to make difficult but necessary decisions.

The important advantage that a statutory authority would have over a division of a department is that there would be checks and balances on both Ministerial powers and the responsibility of officials. For example, the Minister could still intervene directly, but such action would be publicly reported and noted. Constraints on the statutory authority would occur through the requirement that the managing director and the board justify their performance (including both their management decisions and their expenditure) to the Parliament and the public.

An office which had similar checks and balances to those just described would have similar advantages to a statutory authority. However, it could be difficult to implement some of these in an office. For example, to date no Minister has had a statutory obligation to list all his or her directions to an office in the Australian Government Gazette.

11.9 Industry involvement in decision making

It was emphasised earlier in this chapter and throughout Part I of the statement that the industry has an important role to play in fisheries management. It has been pointed out that the industry already participates in decision making in the major Commonwealth fisheries through the activities of the management advisory committees which provide an important means through which the fisheries managers and the industry can communicate.

The Government believes that the role of management advisory committees is valuable and should be enhanced. Management advisory committees could fall into two categories — those with advisory functions only and those with delegated responsibilities for defined areas of

operation. Even though management advisory committees could have considerable delegated responsibility, the fisheries management organisation would remain answerable to the Parliament and the public for the decisions and actions of the management advisory committees.

Although each of the three administrative options could provide an enhanced role for the management advisory committees, the devolution to them of responsibility for certain operational matters would probably be easier if it were done by the board of a statutory authority. Decisions by the statutory authority board could be made solely on management grounds and, if necessary, reversed. By way of contrast, it is extremely difficult for a Minister or department to reverse a decision when it means taking away responsibilities previously given to industry. A statutory authority would also allow greater flexibility in progressing the devolution of operational tasks.

11.10 Conclusion — the most appropriate option

From the preceding discussion it is apparent that it is the Government's judgment that a statutory authority is more likely to meet the administrative objectives outlined earlier in this chapter than a government department.

A statutory authority would have advantages arising from its public accountability requirements, the clear identification of Ministerial and authority responsibilities in the enabling legislation, more opportunity for industry involvement in decision making, and increased pressures for cost efficiency. There would be some risks of duplication and additional levels of bureaucracy resulting from the split of functions between a statutory authority and DPIE, although a careful and consistently applied allocation of responsibilities would overcome this problem. There would also be an unavoidable time-lag of about 12 months involved in preparing and passing legislation for a statutory authority.

An office (or bureau) could be structured so as to achieve many of the advantages of a statutory authority. In addition there would be no split of functions and so the dangers of duplication would not arise, nor would there be any tension between two separate organisations. However, there would be less in-built pressure to achieve cost efficiency.

The disadvantage of an office relative to a statutory authority is that it would not be a separate legal identity, and so over time and depending on the personalities involved, it could become very similar in form to a division of a government department. It would also be difficult, in the office environment, to establish the checks and balances necessary to ensure that the strongest possible set of incentives existed for fisheries management to take difficult decisions.

On balance, the Government believes that a statutory authority would provide the best environment in which to undertake Commonwealth fisheries management. Accordingly, the Government will establish by early 1991 a statutory authority — the Australian Fisheries Management Authority — to perform the Commonwealth's fisheries management responsibilities.

12. Outline of the Australian Fisheries Management Authority

Key details

- The Australian Fisheries Management Authority will have responsibility for managing fisheries so as to achieve the Government's management objectives. DPIE will have responsibility for broad fisheries policy matters.
- ABARE and the BRR will, if required, undertake research for the Authority on a contractual basis and will also undertake public interest research, publishing reports on research findings and discussion papers to facilitate public assessment of the performance of the Authority.
- The Authority will be accountable to the Minister for Primary Industries and Energy and to the Parliament and will be required to report regularly to the industry and the community generally. Unlike some statutory marketing authorities the industry will not be able to require the Minister to terminate appointments to the board if it is not satisfied with the Authority's performance.
- The board of the Authority will be expertise based and will comprise an independent chairperson, the managing director of the Authority, a government director, and directors with expertise in the fishing industry, fisheries science, natural resource economics, and commercial management:
 - the directors other than the chairperson, managing director and government director, will be selected for their expertise by a selection committee on which the fishing industry will be represented.
- The industry will be required to meet the costs of the Authority in proportion to the benefits it receives from fisheries management:
 - that proportion, estimated by the BAE in 1986 to be 90 per cent, will be reviewed by the Industry Commission.

The Government has already established guidelines for statutory authorities in *Policy Guidelines for Statutory Authorities and Government Business Enterprises* (AGPS, Canberra, October 1987) and in *Reform of Commonwealth Primary Industry Statutory Marketing Authorities* (AGPS, Canberra, January 1986). The details of the Australian Fisheries Management Authority (AFMA) set out in this chapter are consistent with those guidelines.

This chapter also sets out the links between AFMA and other bodies, and the ongoing role of the Department of Primary Industries and Energy in fishing industry policy.

12.1 Functions of AFMA and DPIE

A clear distinction between the functions AFMA will handle and the functions DPIE will retain is fundamental to AFMA meeting the administrative objectives identified in Chapter 11.

AFMA will be responsible for all aspects of fisheries management and will therefore be responsible for the development of fisheries management plans and their implementation and operation. In undertaking these management responsibilities AFMA will be required to meet objectives set out in its enabling Act. These objectives will reflect the new policy directions outlined in Part I of this statement and will include:

- ensuring that Australia's living marine resources are developed and used on a sustainable basis;
- ensuring that fisheries are managed in an efficient and cost effective manner and that the management environment will foster an efficient and dynamic fishing industry; and
- ensuring that the community receives a return from private entrepreneurs in exchange for the right of access to fisheries.

By way of contrast the objectives of the fisheries policy group within DPIE will be very similar to the functions undertaken by other parts of DPIE which handle other primary industry commodities. These functions will centre around providing advice to, and support for, the Minister on broad industry matters including matters affecting the industry's profitability and market access. They will encompass the impact of government policies (including budgetary policies) on the industry, and will also include environmental considerations which are not specifically related to fisheries management.

Functions and responsibilities of AFMA

The functions of AFMA will include:

1. Developing and implementing management plans for commercially exploited Commonwealth fisheries.
2. Developing and implementing exploration and feasibility fishing plans for developing fisheries.
3. Setting appropriate catch limits or effort constraints on the basis of biological and economic advice to meet the statutory objectives.
4. Collecting monies in exchange for access to the fisheries.
5. Developing and managing fisheries adjustment programs and restructuring packages.
6. Increasing industry participation in management through management advisory committees.

7. Participating in negotiations about foreign fishing vessels' access to the Australian Fishing Zone.
8. Participating in international meetings which have direct implications for the management of Australia's domestic fisheries.
9. Establishing management related research priorities with the assistance of ABARE, the BRR and any other relevant government agencies — for example, CSIRO.
10. Establishing and maintaining a register of Commonwealth fishing rights.
11. Managing fisheries surveillance and enforcement programs.
12. Managing logbook and observer programs for Commonwealth fisheries and ensuring that logbook data is provided to research organisations and the industry as quickly as possible.
13. Undertaking the Commonwealth's fisheries management responsibilities in relation to joint authorities.
14. Participating in negotiations with State Governments on issues which affect the management of Commonwealth fisheries, including matters concerning the Offshore Constitutional Settlement.
15. Ensuring that the interests of recreational fishermen are adequately considered in fisheries management decisions.

In undertaking these activities AFMA will be required to seek the advice of the management advisory committees and to encourage them to play an increasingly central role in the development of management policies and the implementation of operational functions.

Functions and responsibilities to remain with DPIE

The functions of the DPIE group will include:

1. Scrutinising AFMA's annual report and management plans, and drawing both on this information and also material published by ABARE and the BRR in order to advise the Minister on AFMA's compliance with its statutory objectives. As it is not the Government's intention that DPIE become involved in the detailed management of fisheries, the role of the DPIE group would be to undertake periodic assessments of the overall performance of the Authority and to advise the Minister on strategic policy issues.
2. Providing advice to the Minister on broad fishing industry matters such as:
 - budgetary policy (including taxation), which may affect the fishing industry;
 - resource use policies and conflicts other than those between fishermen;

- broad access policies and the appropriate level of payments to be made for access rights;
 - environmental issues which are not specifically management related — for example, guidelines for pulp mills and the influence of the greenhouse effect on fisheries; and
 - fisheries marketing issues including appropriate encouragement of downstream processing and value adding industries, encouragement of the fishing industry to use export marketing programs such as the Innovative Agricultural Marketing Program, ongoing monitoring of overseas developments which could affect markets for Australian production, and removal of market impediments.
3. Handling those fishing issues which do not have direct management implications in the Australian Fishing Zone, including participation in international forums such as the OECD and in the Commission for Conservation of Antarctic Marine Living Resources.
 4. Negotiating agreements between governments on behalf of the Commonwealth which are of a significant nature.

12.2 Links with other organisations

The broad nature of the links between AFMA, DPIE, the BRR, ABARE and various external organisations are important and will reflect in part the types of activity involved. These links are shown in Figure 12.1. The brief discussion which follows categorises activities into research oriented, management related, or intergovernmental.

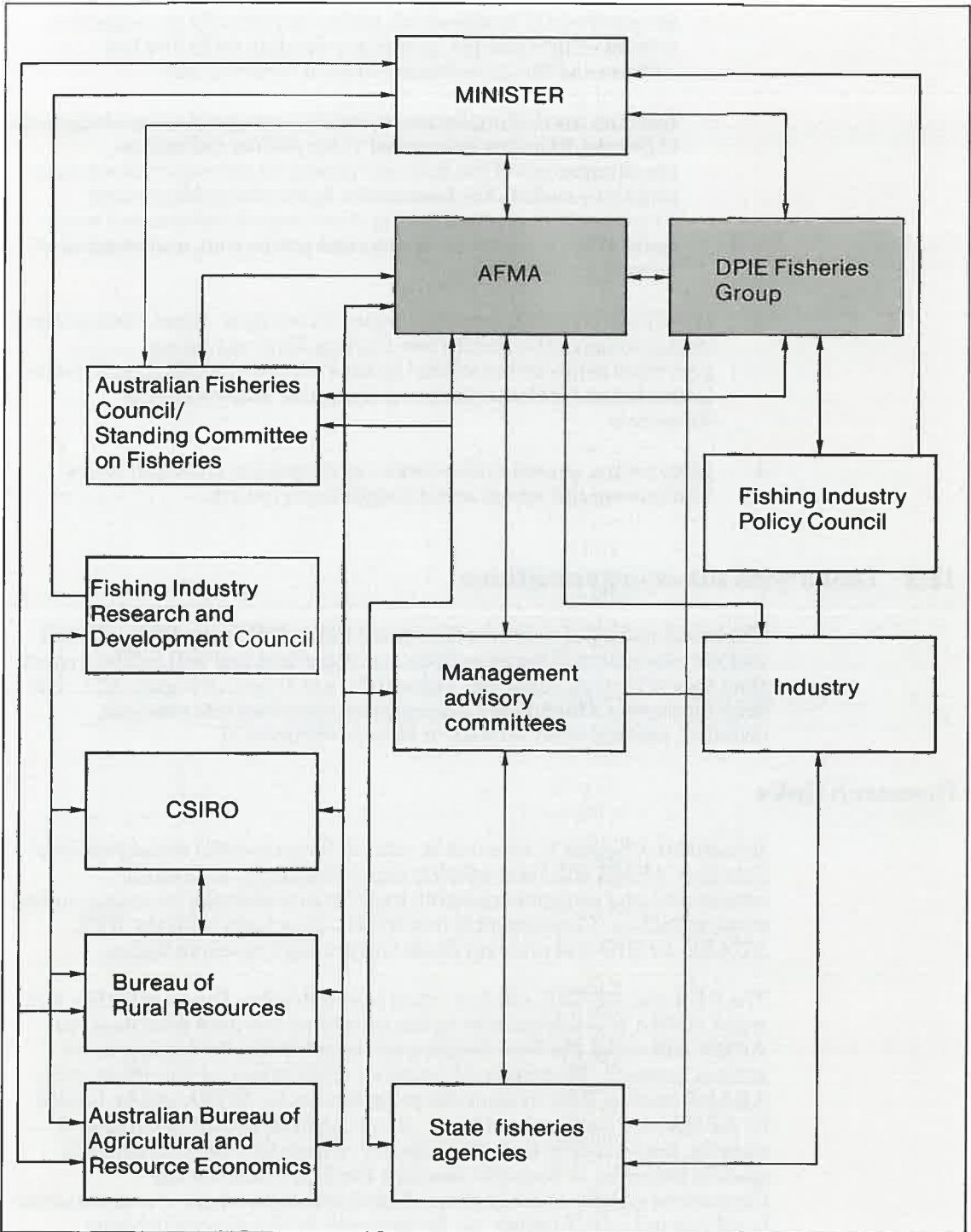
Research links

As noted in Chapter 8, research is vital to the successful management of fisheries. AFMA will have specific requirements for both stock assessment and economic research in order to undertake its management responsibilities. Consequently it will form close links with the BRR, ABARE, CSIRO and relevant State Government research bodies.

The BRR and ABARE will have dual research roles. In one role they will assist AFMA to establish management related research priorities, but AFMA will make the final decision on the priorities for management related research. Management research undertaken (or coordinated) by ABARE and the BRR to meet the priorities set by AFMA will be funded by AFMA on a contractual basis, along the lines set out in Chapter 8 — namely, cost recovery from the industry, where the research benefits specific fisheries, or from the research funds provided by the Commonwealth for management related research, where it is not feasible to rely on industry funding, as, for example, in developing fisheries.

In their second role, ABARE and the BRR will provide independent and highly professional advice to the Minister on economic and biological aspects of fisheries management, and will publish research reports and discussion papers in the public domain. ABARE will address the

Figure 12.1
 Future organisational links in Commonwealth fisheries management



economic aspects of fisheries management, while the BRR will prepare annual stock reports on designated species and publish annual position papers setting out these assessments.

Because the Government recognises that ABARE and the BRR will have an increased workload under the new administrative arrangements, the Government will provide additional appropriations (if justified) to these bureaux to enable them to meet their enhanced responsibilities. The roles of ABARE and the BRR and the additional funding arrangements were discussed in Chapter 8.

CSIRO will undertake much of the management related research for AFMA and there will be close links between the two organisations.

The above approach is consistent with the Government's overall policies for research — namely, to increase the relevance of the research undertaken by public institutions through contractual arrangements with industry, while not compromising the overall commitment by the Government to fund research which is in the public interest.

The Fishing Industry Research and Development Council's (FIRDC) role in funding fisheries research will change as a result of the new administrative arrangements. While FIRDC will have important links to AFMA, it will not be the primary source of research funds for specific management related research.

The scientific advisory committees (discussed in Chapter 8) will continue to play an important role in the research process, as will the State research agencies, and both will have links to AFMA and FIRDC.

Management and industry links

AFMA will have a statutory responsibility to establish and develop management advisory committees in order to progressively enhance their role in management. The AFMA board will be accountable for the management of the fisheries, and so will need to monitor the decisions of the management advisory committees to be confident that they are acting responsibly. The board will devolve responsibilities to a management advisory committee only if it judges this to be both feasible and cost effective.

The members of the management advisory committees will be appointed by the AFMA board after consulting with the industry and, as appropriate, State Governments. The committees will include industry members, the AFMA fishery manager, State Government representatives and, when the board judges it appropriate, an independent chairperson and secretariat. Scientific and economic experts may be either included in the membership of the management advisory committee or called on for advice when necessary.

The management advisory committees will have very close links to AFMA, and little interaction with DPIE. However, the industry will have links to DPIE through the Fishing Industry Policy Council (FIPC) which will replace the Fishing Industry Policy Council of Australia (FIPCA). FIPC will provide expert advice to the Minister on fisheries issues other than those specifically related to management. These issues will have

much in common with many of the functions undertaken by the DPIE group — for example, general commercial issues affecting the catching, marketing and processing of fish, environmental issues and resource use issues. Hence, while FIPC will have some links to AFMA for discussion about general fisheries management issues, it is envisaged that FIPC will have more frequent contact with DPIE.

Membership of FIPC will be broader than the membership of FIPCA and will include representatives from the catching, marketing and processing sectors, a representative from the National Fishing Industry Training Council, and also representatives of recreational fishermen and the general community, the latter to represent environmental and consumer interests.

The National Fishing Industry Council is the peak industry body of the Australian fishing industry. As an industry body it will make representations to AFMA, DPIE or directly to the Minister on a range of issues, both management related and otherwise, which are affecting the fishing industry.

Links with other government bodies

AFMA will have close links with the fisheries agencies of the States and the Northern Territory on the details of fisheries management. This will necessitate developing appropriate mechanisms for consultation between AFMA and State fisheries agencies. On broad industry matters affecting State or Northern Territory Governments DPIE will also have direct contact with the relevant fisheries administrations.

DPIE will be responsible for negotiations of a significant nature between governments with AFMA also being represented on the negotiating team. The Department of Foreign Affairs and Trade will continue to be involved in negotiations relating to bilateral agreements and regional management issues. DPIE will take primary carriage of Antarctic fishing issues.

DPIE will represent the Commonwealth on the Standing Committee on Fisheries. Where management issues affecting the Commonwealth are involved, the chief executive of AFMA will participate in the meeting as part of the Commonwealth delegation.

12.3 Accountability requirements for AFMA

AFMA will be accountable at three levels: to the Minister, to the Parliament and to the industry and the general public.

Each year AFMA will have to provide the Minister with an operational plan setting out the means by which it will achieve its statutory objectives. It will also have to provide a three to five year corporate plan, and fishery specific management plans. The Minister will approve, reject or modify these documents.

AFMA will be accountable to the Parliament through its annual report, the auditing activities of the Commonwealth Auditor-General, and Parliamentary Committees, particularly the Senate Standing Committee on Finance and Public Administration.

AFMA will be accountable to the fishing industry and the general public through its annual report and the regular public meetings it will hold in fishing ports of significance to Commonwealth fisheries. It will have to explain and justify its actions, but it will not be subject to direction by industry (or other) special interest groups.

These reporting requirements are similar to those required from other statutory authorities, including statutory marketing authorities. However, they stop short of allowing the industry to debate and vote on specific motions, including levy determination and confidence in the chairperson or the board as a whole, at annual general meetings.

For some statutory marketing authorities the industry involved can pass a motion of no confidence in the chairperson or board, and the Minister is then required to terminate their appointments. In the case of AFMA it is not appropriate for a public meeting to be given these powers because AFMA is a management/regulatory body administering the Government's fisheries management policy.

At times AFMA will be required to make tough decisions, which may involve the imposition of conditions on the rights of individuals or groups of individuals in order to protect the fisheries resource and the community's interests. In these circumstances, it is clearly inappropriate for the industry or the public to have powers which could lead to the dismissal of the board as these powers would be a constant threat which could be used to ensure that the board never took any tough decisions.

12.4 Constitution of the board

The board of AFMA will be responsible for meeting the statutory objectives of fisheries management. It will be responsible for overseeing the operations and performance of AFMA. Even though it may devolve some policy and operational functions to management advisory committees, it will still be responsible for the activities of those committees. It is necessary, therefore, to structure the board so that it can fulfil the essential requirements of fisheries management.

Members of the board will be selected on the basis of their expertise and, apart from the managing director of AFMA, they will perform their duties on a part-time basis. The chairperson and government director will be selected by the Minister, the managing director will be selected by the board itself, and the remaining board members will be nominated by a selection committee, with the Minister making the appointments provided that he or she is satisfied with those nominations. Appointments will be for a four year period. The composition of the board will be along the following lines:

- chairperson (independent, not associated with fishing industry);
- managing director of AFMA;
- government director; and
- directors with high level expertise in fishing industry operations (2 directors); fisheries science (1 director); resource economics (1 director); and commercial, economic or financial management (1 director).

The Minister will appoint one of the board members as the deputy chairperson.

The chairperson of the board will report to the Minister on substantive matters and provide feedback to other members. The government director will, in addition to other duties, provide input by informing the board of government policies and accountability procedures, but will not be responsible for reporting to the Minister.

The eligibility criteria for board membership will be set out in legislation, and a statutory selection committee established for selecting high calibre persons to the board. The selection committee will consist of six persons — an independent chairperson (appointed by the Minister), two members appointed by the Minister one of whom will represent conservation interests, two members nominated by the National Fishing Industry Council, and a member nominated by the Standing Committee on Fisheries.

12.5 Legislative aspects

AFMA will be established under its own Act which will specify the functions it must fulfil, the objectives it must meet, and the powers it will have. The Act will include transitional arrangements to preserve existing fishing access rights and enable the transfer of existing Australian Fisheries Service assets to AFMA, and will include other financial and administrative provisions required in the creation of the statutory authority.

As the Fisheries Act is to be revised to effect the changes in policies outlined in Part I of this statement it is desirable to revise all fisheries management legislation at the same time in order to fully integrate the management legislation with the new administrative arrangements. The suite of fisheries legislation includes:

- AFMA Act;
- Fisheries Management Act;
- Fisheries Management (Commonwealth/State) Arrangements Act (for Offshore Constitutional Settlement matters);
- a Fisheries Charges Act; and
- amendments to a number of related Acts, including the *Continental Shelf (Living Natural Resources) Act, 1968*, the *Torres Strait Fisheries Act, 1984* and the *Fishing Industry Research and Development Act, 1987*.

The Government's objective is to prepare this suite of legislation for the Budget Sittings in 1990.

12.6 Funding arrangements

Peat Marwick Hungerfords estimated that a statutory authority would cost between \$1.4 million and \$3.5 million a year more than the current administrative arrangements. The wide cost range arises because there

are some expenses which are currently not charged to the Australian Fisheries Service which they considered might be charged to a statutory authority — for example, superannuation, legal costs, auditing expenses, depreciation and security expenses. The consultants did not make allowance for establishment costs associated with relocation expenses, transfer of assets including computer equipment, interest charges associated with any borrowings and redundancy arrangements for staff not transferred.

As indicated in Chapter 4, the Government's policy is that the proportion of management costs that fishermen should meet should correspond to the proportions of benefits they receive. In 1986 the then Bureau of Agricultural Economics (BAE) estimated that at least 90 per cent of the benefits of fisheries management were received by the commercial fishing industry. This implies that it is appropriate for the fishing industry to pay 90 per cent of the costs of commercial fisheries management.

However, the Government recognises that the proportion of benefits received by the industry and the community may vary over time, and indeed between fisheries at different stages of development. Since the proportion of benefits received by the industry will be the basis of the industry's management levies to fund AFMA, it is important that this figure accurately reflect the circumstances confronting the industry and the community. Accordingly, before the end of 1991, the Industry Commission will review the 1986 BAE estimate of 90 per cent. The Industry Commission will undertake subsequent reviews of this estimate at five yearly intervals thereafter.

As an interim arrangement (until the Industry Commission review is complete), the Government will require the industry to meet the same proportion of the combined costs of AFMA and the DPIE fisheries group that it meets of the total cost of the Australian Fisheries Service's operations in the final two years of its existence.

12.7 Review of operations of AFMA

While the Government considers the creation of a statutory authority is the most effective way of discharging its fisheries management responsibilities it is aware that there are a number of factors that could affect its success. These include the relationship between AFMA and DPIE and between AFMA and the various State fisheries agencies.

The Government has therefore decided that it would be appropriate to refer the operation of AFMA to the Industry Commission after its first five years of operation to determine how effectively it was achieving its charter and to determine what changes, if any, would further assist achievement of the Government's fisheries management objectives.

GLOSSARY

Age class: a group of fish born in the same year.

Aquaculture is the cultivation of plants and animals in water.

Australian Fisheries Council is a Council comprising the Commonwealth and State/Territory Ministers with responsibility for fisheries matters.

Autonomous adjustment is industry restructuring or change which occurs automatically in response to technological change, or the demand for a product so that the industry continually adjusts towards maximum efficiency.

Biomass: an aggregate weight, at a particular time, of fish (or other organisms) in a stock or in a fishery.

By-catch is non-target species taken incidentally to fishing activity.

Common property occurs where the rights to exploit a particular resource are held collectively by two or more persons.

A developed fishery is one which is currently being commercially exploited at or near full capacity and for which a well established set of fishing rights exists.

A developing fishery is a fishery in which experimental or feasibility fishing is being undertaken to determine whether the resource can support a commercially viable fishery.

Driftnets are large nets, which hang from the sea surface and may be several kilometres in length. These nets are suspended across the path of migrating fish schools, fish strike the net and become entangled in the mesh of the net. Driftnets longer than 2.5 kilometres are banned in the Australian Fishing Zone.

Economic efficiency is a measure of how well economic inputs (capital, labour, etc) are combined to produce a given output. Economic efficiency is maximised when inputs are combined so as to produce the required output at minimum cost.

Economic over-fishing occurs when expenditure on fishing exceeds the level necessary to maximise economic rents.

Environmental carrying capacity is the amount of fish (or other marine organisms) which an environment can support.

Feasibility fishing is fishing undertaken to test the economic viability of a new fishery.

Fecundity: the numbers of eggs (or offspring) produced by a female; for fish species the number of eggs (or offspring) produced usually increases as the size of the individual increases.

Fish: used as a collective term, includes molluscs, crustaceans and any aquatic animal which is harvested.

Fisherman: not intended to be a sexist term — a word in common acceptance throughout the industry used to describe any male or female engaged in fishing activity.

Fishery: a loosely defined term describing a range of activities or characteristics associated with the exploitation of a fish resource, a fishery can be defined by the fishing method used, the types of fish taken and the area where fishing occurs.

Fishing capacity is the amount of fishing effort that a fishing boat, or a fleet of fishing boats could exert if not constrained by restrictive management measures.

Fishing effort is the amount of fishing activity undertaken. It is measured by the total time spent fishing combined with quantity of gear used, for example the number of hooks, number of times the net is shot per day, etc.

Fish stock: synonymous with 'unit stock' or population. An interbreeding group of individuals of a single species.

Joint Authority: an arrangement under the Offshore Constitutional Settlement under which a particular fishery or group of fisheries is managed jointly by the fisheries Ministers of the Commonwealth and one or more States under a single jurisdiction (either Commonwealth or State).

Natural mortality: deaths resulting from natural causes.

Normal returns: the return, or profit, which is just sufficient to induce an individual to remain in his present activity, that is, it is equal to the opportunity cost of remaining in that activity.

Offshore Constitutional Settlement (OCS): a series of legislative and administrative agreements designed to rationalise jurisdictional arrangements for a number of complex offshore constitutional issues, particularly legislative responsibilities between the Commonwealth and the various States (including the Northern Territory) in respect of petroleum, mining for minerals, fisheries, historical shipwrecks, marine parks, crimes at sea, and the regulation of shipping and navigation.

Opportunity cost: the profit that could be earned by putting resources into the next-best alternative activity, that is, the value of other activities forgone by engaging in current activities.

Over-capacity occurs when the number of boats fishing exceeds that required to efficiently exploit the fishery.

Over-capitalisation occurs when the amount of capital invested in a fishing fleet exceeds that required to operate at the point of maximum economic efficiency.

Predation is the killing (and eating) of fish by other (usually bigger) fish and other animals.

Price taker: a seller who is small in terms of the size of the market and who cannot either by increasing or decreasing the quantity supplied affect the price at which he/she sells.

Prospectivity is the commercial potential of a currently undeveloped resource or area.

Recruitment: the entry of new fish into that part of a stock which is subject to capture by the gear used in the fishery.

Sashimi refers to a Japanese method of presenting and eating raw seafood.

Structural adjustment refers to changes which occur in an industry in response to technological change or market demand. In most industries these changes occur automatically (autonomously) so that the industry remains economically efficient. Because of market failure in the fishing industry autonomous adjustment does not occur (except where ITQs are used) and other measures must be introduced to insure that necessary adjustments occur.

Sustainable development: this statement adopts the definition given by the Brundlandt Commission (*Our Common Future, 1987*) that development is sustainable if it meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

Technology transfer: the adoption of new or more advanced production methods or equipment already in use in other areas.