### **INVESTING IN A SUSTAINABLE FISHING FUTURE:**

# The national research and development plan for the recreational sector

OF THE AUSTRALIAN FISHING INDUSTRY





AN INITIATIVE OF

RECFISH AUSTRALIA



Investing in a sustainable fishing future: the national research and development plan for the recreational sector of the Australian fishing industry

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#### Edition 2001

An initiative of Recfish Australia, funded by the Fisheries Research and Development Corporation: project 2000/313

This plan describes the research and development activities that Recfish Australia considers will produce the best environmental, social and economic outcomes for the recreational sector of the Australian fishing industry. It has been prepared for members of Recfish Australia; other recreational and sport fishers; the Commonwealth, state and territory governments; other sectors of the fishing industry (commercial and traditional); the research and development community; and other people who are interested in Australia's fisheries resources and the fishing industry.

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### PREFACE

### The importance of this plan

This is the first strategic plan to give a national focus to research and development (R&D) related to the recreational sector of the Australian fishing industry.

The plan is a milestone on the path by which the recreational sector of the fishing industry will play a much fuller, more influential role in the stewardship of Australia's fisheries natural resources and in influencing the development of the industry.

It is a significant parallel to a program funded by Environment Australia, well under way at the time this R&D plan was prepared, for the development and implementation of a national environment strategy for recreational fishers and their clubs.

Through this new R&D plan, the basis for conducting national recreational fisheries R&D is now accessible to all and clear priorities for R&D strategies are now established.

In preparing it, we are responding to encouragement from the nation's principal fisheries R&D organisation — the Fisheries Research and Development Corporation (FRDC). We are also acting on a 1994 recommendation of the Ministerial Council on Forestry, Fisheries and Aquaculture:

[The Council] urges Australia's legions of anglers, along with state, territory and Commonwealth governments and the wider community, to embrace the National Policy for Recreational Fishing in Australia so that recreational fishing can prosper and develop ....

This major policy, which was a watershed in the national context for recreational fishing, advanced five goals and sixteen principles for which there was strong public support in a long consultative process. The goals have been directly incorporated into the strategic elements of this new R&D plan and the principles have been observed appropriately in preparing it.

The widening scope of fisheries R&D also makes the R&D plan very timely. During the past ten years, Australian fisheries R&D has broadened from a focus on fish species to the ecosystems in which fish live, and in turn to the wider economic and social environment surrounding the three sectors of the fishing industry — the commercial, recreational and traditional sectors.

As part of that broadened focus, in 1996 the Commonwealth Minister for Resources declared Recfish Australia as a representative organisation for the Fisheries Research and Development Corporation in accordance with section 7 of the *Primary Industries and Energy Research and Development Act 1989*. Thus Recfish Australia assumed this role alongside the Australian Seafood Industry Council, which represents the commercial sector. The representative organisations are a key element in the FRDC's accountability to its stakeholders. The FRDC consults with us when it reviews its strategic assessment of the business environment; reports to us at our annual conferences; seeks our advice when evaluating R&D applications; and considers our expectations of the FRDC and our R&D needs. It is in this latter context that the R&D plan is being prepared.

To prepare the plan, a wide range of expert views was gathered, most notably through a workshop of Australia-wide member bodies of Recfish Australia and senior members of the fisheries research community, government agencies and the commercial sector. The FRDC not only provided funding for the initiative; FRDC staff enthusiastically supported the project in many ways, for which we are most appreciative.

An important feature of the plan, perhaps not immediately apparent, is that it is based on a strategic assessment of the recreational sector's R&D needs that is consistent with strategic assessments of a growing number of R&D plans covering other elements of the fishing industry. This consistency will greatly improve our efficiency in targeting R&D funding to meet the needs of recreational fishers.

# The significance of Recfish Australia's national profile

A recent FRDC analysis of the recreational sector included the following comment:

The recreational sector expresses its views in the political arena through a number of associations, including its peak body, Recfish Australia, which is also one of the FRDC's two representative organisations. However, like the commercial sector, the recreational sector's political and self-representational activities concentrate mainly on state bodies and viewpoints, reducing concentration on national interests.

Subsequently the FRDC pointed to the need to increase both sectors' national profiles and resilience in what it described as "the much tougher climate of public opinion-forming and political lobbying that will surround the industry [during the next 20 years]".

The national focus of Recfish Australia's work for the nation's fishers and their representative organisations has never before been so important.

The main issues already affecting or potentially affecting recreational and sport fishing are national in nature, crossing the jurisdictions of more than one state or territory and — increasingly — common to most or all those jurisdictions. More than ever before, these national issues have the potential to greatly affect the future of recreational and sport fishing — whether through degraded land and water resources and fish stocks, management of pest species, riverine environmental flows, water allocation or through the increasingly vexed question of fishing access and opportunities. Also increasingly, many issues in the political sphere are arising suddenly. They require quick, targeted, competent, well-researched responses. In the recent blue (slimy) mackerel controversy, Recfish Australia has been very effective in protecting anglers' interests by significantly influencing and changing Federal Government approaches and management of the issue. In the near future, a major issue will be competition for resource access between the recreational and commercial sectors as the Federal Government begins consideration of catch allocations for the recreational sector.

Why do recreational fishers need a high national profile? There are many reasons. At a practical level there is the vital need to collect comprehensive comparative data, nationally, on economic, environmental and social dimensions of fisheries on which to base decisions for the common good. This can be achieved only with a national approach.

At the political level, we must recognise that many Canberra-based industry and lobby groups are highly effective in today's socio-political maelstrom. Some of them represent minority interests minuscule in comparison with those of the recreational fishing industry. Clearly, it is far more productive to have a national body representing collective interests than to be virtually ignored as small, disconnected entities. A national body representing the views and interests of one-third of Australians who fish for sport and recreation can be a formidable entity.

Clearly, this R&D plan is only one aspect of our sector's national profile. But the research and development that it initiates will be an important factor in supporting a strong national profile for recreational fishers — and through that profile, improvement in the natural resources that we care so much about.

ANGUS HORWOOD President, Recfish Australia

April 2001

### Acknowledgements

First and foremost our thanks go to the Fisheries Research and Development Corporation, which funded our R&D project application to hold the planning workshop and to write and produce the plan. The constructive encouragement of Executive Director Peter Dundas-Smith and Programs Manager Dr Patrick Hone at all stages — including the workshop — made the plan's preparation a stimulating task and ensured that the plan was well integrated into the mainstream of R&D planning for the entire fishing industry.

We were fortunate in securing Clive Huggan, of Pacific Project Management Pty Ltd, Canberra, to prepare the plan and to guide the decision-making of participants in the planning workshop. Clive combined his considerable experience in strategic planning and senior management with a clear focus on fulfilling our particular needs.

Strong support was provided by Graham Pike, Vice-President of Recfish Australia. Graham contributed his extensive experience and many hours of his own time to ensure that all appropriate facets of the recreational sector were addressed in the plan. Recfish Australia's Office Manager, Carol Wind, also worked long hours to ensure the success of the planning workshop.

Our appreciation goes to the 47 people who came together to contribute their opinions and ideas at the November 2000 strategic planning workshop, giving the plan a truly national focus. These people, in addition to those mentioned above, were Jim Barrett, Dave Bateman, Doug Bathgate, Andy Bodsworth, George Collis, Graeme Creed, Andrew Cribb, Christopher Deane, John Doohan, Brian Eldridge, Mark Flanigan, Matt Gleeson, John Harrison, Les Hawkins, Gary Henry, Angus Horwood, Patrick Hunter, Stan Jarzyniski, Ian Jones, Bob Kearney, Rod Lenanton , Jeremy Lyle, Murray McDonald, Mark McKinnirey, Astrida Mednis, Ross Monash, Sandy Morison, Russ Neal, Malcolm Poole, Frank Prokop, Mal Ramsay, Nick Rayns, Les Rochester, Phil Sahlqvist, Bruce Schumacher, Robert Smith, Noel Taylor Moore, Patricia Wade, Ray Walker, Pat Washington, Gordon Winter and Greg Wood. And we thank Professor Tor Hundloe, who kindly detoured to the workshop from an interstate journey to give us a special presentation on significant economic factors, which was particularly welcome.

Thanks also go to Allison Mortlock, of Angel Ink, Canberra, for her design of the cover of the printed version of the plan.

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# ABOUT RECFISH AUSTRALIA

Recfish Australia is the trading name of the Australian Recreational and Sport Fishing Industry Confederation Incorporated, ABN 87 547 561 663. It is the peak national body representing all Australian recreational and sport fishers, whether they are members of a fishing club or not.

### Mission

Recfish Australia's mission is to represent the interests of recreational and sport fishers at a national level to ensure quality fishing.

### Formation of Recfish Australia

The establishment of Recfish Australia in 1983 provided a single point of access to the wealth of knowledge and experience resident in the various recreational and sport fishing organisations, clubs and associations. Conversely, Recfish Australia gave the first opportunity to effectively apply that knowledge and experience in the common interest — to protect fisheries resources and maintain and improve the quality of fishing for all Australians.

The resolution to form Recfish Australia was made at a meeting on 29 and 30 October 1983 of delegates of the seven national organisations representing the various fishing disciplines and interests. The meeting was a response to encouragement from the Hon. John Brown, MP, the Commonwealth Minister for Sport, Recreation and Tourism. The Minister said the Commonwealth Government would, for the first time, fund recreational fishing as part of a policy to increase Australians' participation in healthy and wholesome recreational activities because fishing was such an activity and one in which there could be mass participation. But the Minister made it clear that the Government would support fishing only if it had a single, peak, national, united organisation with which to work.

Initially, the Recfish Australia constitution gave full membership to the seven founding national fishing bodies and associate membership to the peak state/ and territory bodies representing recreational fishers. As recognition of the socioeconomic value and importance of recreational and sport fishing widened through Recfish's work, state and territory governments gave recreational fishing bodies more recognition and support. As a result, the Recfish Australia constitution was changed to remove distinctions between national and state/territory recreational fishing representative bodies, providing equal voting rights for all. The structure and composition of the Recfish Executive no longer operationally reflected the earlier membership distinctions.

Most recently, the constitution was changed to admit individuals and fishing clubs to Recfish Australia membership. Currently, although they can participate in Recfish Australia meetings and activities, and receive Recfish publications, they do not have formal voting rights.

The constitution is currently under review to identify changes which would make it more functional and representative both in funding, delivering and coordinating and a second

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its Research and Development Plan and in continuing its role as the peak national body for all Australian anglers.

### **Objects**

The objects of Recfish Australia, as set out in its constitution, are shown in appendix 2.

### **Voting members**

Recfish's current voting members are:

- Australian Freshwater Fishermen's Assembly (AFWFA);
- Australian National Sportfishing Association (ANSA);
- Native Fish Australia (NFA);
- Victorian Recreational Fishing Peak Body (VRFish);
- Sunfish (Queensland);
- NSW Advisory Council on Recreational Fishing (NSW ACoRF);
- Amateur Fishermen's Association of the Northern Territory (AFANT);
- ACT Sport and Recreational Fishing Council (ACT SRFC); and
- Tasmanian Marine Recreational Fishery Council (which also includes freshwater representation) (TMRFC).

### **Stakeholders**

Recfish Australia's stakeholders are:

- all Australians and visitors who go fishing for sport or recreation in Australia;
- member organisations, clubs and individuals of Recfish Australia;
- members of recreational and sport fishing clubs and associations throughout Australia;
- the Fisheries Research and Development Corporation;
- Environment Australia;
- Commonwealth, state and territory fisheries management agencies and their officers;
- other Commonwealth, state and territory departments, agencies and business enterprises involved in natural resource and environmental management.

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# **ABOUT RECREATIONAL FISHING**

### The deep satisfaction of fishing

It was at Wonboyn Lake, one of the very few relatively untouched estuaries remaining on the NSW coast, just a month before the workshop held to develop this national R&D plan. An excited boy's voice broke the early morning campground stillness on the track to the jetty.

"C'mon Daddy, c'mon", the voice pleaded, then its owner half-skipped into view through the bush. About eight years old, he was definitely going fishing — they were going fishing. All geared up with new tackle box and rods, the youngster, his obvious disability forgotten for now, was hand-in-hand with his Dad, tugging him along, leading the charge to the water.

"We're going fishing mister!", the boy beamed, his obvious happiness equalled only by Dad's undisguised smile of delighted pride.

Fishing closely together on the end of the jetty, it wasn't long before nature fulfilled their dream. A shout of pure joy from the youngster, a quiet word of instruction from Dad, and a takeable bream broke the glass-calm water on the boy's new rod.

What passed between father and son was that look, beyond words, known only by mums and dads, grandparents, aunts and uncles, when a young face looks up, thrilled beyond measure, from admiring the first catch. It communicates a bond from deep inside, felt for a lifetime.

That's what only fishing can do for the human spirit. That's what fishing is all about.

Fishing reawakens and forges intimate and deep bonds — infinite bonds, quite often subconscious, between the human animal and Earth's natural systems, its other animals, plants, trees, water, rocks, weather patterns, winds, waves, and between humans themselves.

These bonds form the basis of personal values and, collectively, social values which, in turn, drive millions of us to pursue the activity of fishing in one of its many forms.

In the culture of developed nations (from which, ironically, we seek periodic relief in fishing) this recreational fishing activity generates an industry whose measure is big money and big numbers of voters. That's what attracts the interest and attention of governments and their economists.

# An activity by millions, with far-reaching consequences

Recfish Australia originally established through surveys — since confirmed by numerous others — the inextricable link between fisheries resources and human and social values, and the fact that these ultimately underpin huge commercial and industrial activity. As the 1999–2000 annual report of the Fisheries Research

and Development Corporation says, "the recreational sector of the fishing industry is larger — and more widely dispersed — than in any other natural resource industry that supports a prominent commercial sector".

Fishing was the first sporting and recreational activity by Europeans in Australia, being recorded in several narratives of the First Fleet at anchor in Sydney Cove. Aboriginal and Torres Strait Islander people, by then, had been fishing for at least 60,000 years using practices that characterise the third sector of today's fishing industry — the traditional sector. Now, fishing is the second-largest single outdoor activity after swimming. Surveys show that fishing is enjoyed by five million or more Australians — between 25 and 30 per cent of the population.

While all outdoors activities provide physical and social benefits to the community, fishing offers some unique advantages. Australians go fishing for a variety of reasons: to compete in tournaments and championships, to relax and unwind and enjoy the Australian outdoors, and to savour the culinary delights that fish provide.

Surveys also show that more than 250,000 Australians are members of fishing clubs and that most of these people fish competitively each year. The rules for various types of fishing competitions or tournaments are drawn up by Recfish member bodies. Clubs conduct competitions in accordance with these rules; in some cases they elect to have their own rules.

Although previous surveys have found that most sports do not cater well for women, this is not the case in fishing. Recreational fishing surveys show that about 15 per cent of Australian women fish regularly and that many women now hold open world records in fishing.

An increasing trend is for many clubs to adopt a catch-and-release philosophy in their tournaments — tagging the fish before returning them unharmed to the water. More than 1,000 fishing clubs in Australia hold monthly tournaments, totalling about 12,000 club competitions annually across Australia. In addition to club tournaments, there are many regional, state and national championships.

Competition fishing requires a high degree of skills, good hand-eye coordination and physical exertion. For the 250,000 registered competitive Australian fishers, fishing comes within the Australian Sports Commission's definition of organised competitive sport. This makes fishing the eighth-largest competitive sport in Australia.

Fishing also offers various levels of physical activity (walking, carrying, casting, bait gathering, retrieving fish, etc) interspersed throughout the fishing outing. In this, fishing has advantages over other sports which involve a shorter period of more vigorous exercise. Consequently, unlike many other sports and recreations, fishing can be enjoyed by all Australians with varying degrees of physical fitness and abilities.

Without a tangible industry created by these activities, governments would have been much less likely to include recreational fishing in the political equation and to give form to various rights of recreational fishers. The benefits derived from being electorally and economically significant are accompanied by responsibilities. Recreational fishers must invest in the protection and well-being of the natural resources on which they depend. In addition to being vitally important in its own right, doing so raises the quality of the human fishing experience. That is why the sustainability of fisheries' natural resources is the first focus of this R&D plan.

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# THE RECREATIONAL SECTOR'S BUSINESS ENVIRONMENT

For a comprehensive description of the business environment of the entire fishing industry (including challenges during the next 20 years), please refer to the Fisheries Research and Development Corporation's R&D plan 2000–2005, available at www.frdc.com.au or from PO Box 220, Deakin West ACT 2600; telephone 02 6285 0400, fax 02 6285 4421.

### National and state/territory context

Until the mid-1990s, recreational fishing management, particularly in relation to angling, had received little attention, and virtually no management or funding at a national level. However, in recent years some state and territory governments have paid increasing heed to a fundamental reality — recreational fishing is a major activity which provides substantial community benefits, but which can also have a significant impact on many fish stocks.<sup>1</sup>

This change was observed in 1994, when the Ministerial Council on Forestry, Fisheries and Aquaculture endorsed a national policy on recreational fishing which responded to the aims and ideals envisaged for recreational fishing at the start of a long consultative process. The national policy took account of opinion expressed at 61 public meetings and in 431 written submissions and 4,957 completed questionnaires from around Australia. There was strong public support for the five goals and sixteen principles set out in the policy, which are reproduced in appendix 1 to this plan. As noted earlier, the goals have been directly incorporated into the strategic elements of this R&D plan (see page 41) and the principles have been observed appropriately in preparing it.

The national policy document stated:<sup>2</sup>

The next challenge is to make [the goals and principles] work for the betterment of recreational fishing and aquatic environments throughout the country.

This is a two-way process, and fishers should ensure that they play their part by not only incorporating the goals of this policy in their fishing practices, but by ensuring that government agencies do the same.

It should be recognised that some of the broad strategic directions and actions outlined in the policy may require substantial funding ....

The principles and goals should at least be considered by all government agencies whose policies and operations directly or indirectly affect recreational fishing.

2 Recreational Fishing in Australia: a National Policy, Foreword, page ii.

Recreational Fishing in Australia: a National Policy, National Steering Committee on Recreational Fishing, ISBN 0 7309 6433 7, Department of Primary Industries and Energy (now Department of Agriculture, Fisheries and Forestry – Australia), Canberra, 1994. Introduction, page 5.

Further comments included the following:<sup>3</sup>

The time has come for a national policy that puts the management of recreational fishing into the overall context of environmental and aquatic resource management.

This policy provides a framework and a common set of goals within which each responsible Commonwealth, state and territory authority can work with the recreational fishing community to develop suitable long-term policies.

It does not aim to usurp the recreational fishing management responsibilities of the states and territories. Rather, it is intended to offer guiding principles for conserving and enhancing Australia's recreational fish stocks and their habitats. Its goals and objectives offer a conceptual foundation for governments and recreational fishers to build upon.

It is difficult to determine the extent to which Commonwealth, state and territory policies developed since 1994 — in all their variety — have taken the national policy's goals and principles into account. The national policy does, nevertheless, act as a clear benchmark against which appropriate policies may be assessed. For this reason, it has been (and will continue to be) very important in determining Recfish Australia's national responses to actions by governments, other sectors of the fishing industry and entities that affect environmental, social and economic factors related to recreational fishing.

Some of the current issues to which fisheries administrators and managers in the states and territories are giving attention include:

- the eventual introduction of all-waters licences or in the states which already have them — the application of licence revenues, also encompassing commercial licence buy-outs;
- commercial fishing in riverine fisheries, estuaries and inlets;
- formulation and enforcement of fisheries regulations;
- illegal fishing;
- introduction or refinement of fisheries co-management;
- management and enhancement of freshwater fisheries of high value to regional communities;
- gill netting;
- catch limits;
- stocking;
- fishing access; and
- capitalising on opportunities for increasing recreational fishing access.

These issues have been incorporated in recent years into a "total ecosystem" emphasis that is increasingly being applied to fisheries management arrangements and to associated information requirements, assessment procedures and management responses.

<sup>3</sup> Recreational Fishing in Australia: a National Policy, Introduction, page 5.

Issues common to two or more states / territories are usually environmental in nature, including — but not confined to — introduced fish species and pests; salinity; land management practices; algal blooms and water quality generally; water allocation and environmental flows; ESD and the development of ESD indicators; estuarine disturbance and loss; and species translocation.

Given the increasing regulation of recreational fishing by legislation and government policies, and given increasing effectiveness in lobbying government and public opinion by some sectional interests, timely and comprehensive action to represent the recreational sector in policy-making continues to be crucially important.

### Fishing industry context

#### The three sectors of the Australian fishing industry

Recfish Australia uses the following definitions of the fishing industry, which were developed by the FRDC.

The fishing industry includes any industry or activity conducted in or from Australia concerned with taking, culturing, processing, preserving, storing, transporting, marketing or selling fish or fish products.

Figure 1:

Components of the fishing industry



\* The recreational and traditional sectors also use the wild-fish resource.

In addition to fishing and shell-collecting in accordance with their traditions, Aboriginal and Torres Strait Islander people also pursue recreational fishing (that is, not using traditional practices), subsistence fishing (following traditional or recreational practices), and commercial fishing.

As shown in figure 1, the recreational sector is one of the three principal sectors of the fishing industry. It comprises enterprises and individuals associated — for the purpose of recreation, sport or sustenance — with fisheries resources from which products are derived that are not for sale.

(assessing)

The other two sectors of the fishing industry are as follows:

- The commercial sector comprises enterprises and individuals associated with wild-catch or aquaculture resources and the various transformations of those resources into products for sale. It is also referred to as the "seafood industry", although non-food items such as pearls are included among its products.
- *The traditional sector* comprises enterprises and individuals associated with fisheries resources from which Aboriginal and Torres Strait Islander people derive products in accordance with their traditions.

# The main issues confronting the fishing industry today

The FRDC has nominated as the main issues confronting the fishing industry today:

#### 1. Concerning the natural resource base

It is necessary to increasingly pursue ecological sustainability so that the needs of the present may be met without compromising the ability of future generations to meet their own needs.

#### 2. Concerning the operating environment

It is necessary to create an operating environment that is conducive to all three sectors of the fishing industry actively participating in pursuing ecological sustainability — which will inevitably incorporate the following, among other things:

- for all three sectors: objectively based, secure access to fisheries natural resources; and
- for the commercial sector: market access and development, maximum seafood value, and equitable financial returns for every enterprise in the production chain.

#### 3. Concerning the contributions of people

It is necessary to make more effective use of people, including by:

- improving the capabilities of the people to whom the industry entrusts its future, and improving communication between them; and
- developing the community's knowledge of, and involvement with, the industry and its products.

### **R&D** organisational context

The R&D organisation of greatest significance to the recreational sector of the fishing industry is the Fisheries Research and Development Corporation (FRDC). Funded by the Commonwealth Government and the commercial and recreational sectors of the fishing industry, it is the leading Australian agency concerned with planning, funding and managing fisheries R&D.

Recfish Australia has a significant, legislated role in the FRDC's accountability to its stakeholders. In 1996 the Minister for Agriculture, Fisheries and Forestry declared Recfish Australia to be a representative organisation of the FRDC in accordance with section 7 of the *Primary Industries and Energy Research and Development Act 1989*. (The other representative organisation is the Australian Seafood Industry Council, representing the commercial sector.)

The FRDC consults with both representative organisations when it reviews its strategic assessment of the business environment; reports to them at their annual conferences; has regard to their expectations of the FRDC and to their R&D needs when preparing the FRDC's R&D plan; and seeks their advice when evaluating R&D applications.

In addition, there are links at many levels between Recfish Australia and other entities involved in fisheries R&D. Some links are reflected in the list on page 26 of bodies in which Recfish Australia has an interest. Most prominent among them are Agriculture, Fisheries and Forestry – Australia; the Australian Fisheries Management Authority; and Environment Australia.

### **Environmental context**

### **Ecologically sustainable development**

The Australian community has become increasingly aware of the need to protect marine, estuary and river ecosystems, and to maintain biological diversity in ecosystems that support fisheries. Awareness of the inter-connectedness of ecosystems (such as those of coastal plains and the continental shelf) is also increasing. The ability of aquatic environments to sustain fishing yields or provide other benefits is a focus of interest, accompanied by growing awareness of the influences of the various uses of fisheries — commercial (wild-catch and aquaculture), recreational and traditional. All these subjects involve aspects of ecologically sustainable development (ESD).

Sustainable fishing practices not only safeguard the environment but also the industry.

Although there is no universally accepted definition of ESD, the following (from the National Strategy for Ecologically Sustainable Development 1992) is often cited in Australia:

Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

In a similar vein, the essence of ESD (World Commission on Environment and Development, *Our Common Future* [the Brundtland Report], Oxford University Press, Oxford, 1987) is:

To meet the needs of the present without compromising the ability of future generations to meet their own needs.

In essence, ESD is development that aims to meet the needs of Australians today while conserving ecosystems for the benefit of future generations. To do this, the

environmental resources that form the basis of our economy need to be used in a way that maintains — and where possible improves — their range, variety and quality. At the same time, those resources need to be used to develop an economy that constantly seeks to improve its efficiency and productivity. ESD is therefore not simply concerned with optimal resource management but with the full spectrum of factors involved in sustainable economic, environmental and social development.

ESD presents one of the greatest challenges to Australia's governments, industries, businesses and the community. An effective level of progress towards ESD for fisheries requires a strong economy, because many environmentally beneficial measures — such as bycatch reduction and amelioration of agricultural run-off into nursery grounds — cost money. As the major user of fisheries natural resources, the commercial sector of the fishing industry needs to be vigorous and profitable, because businesses that are struggling for economic survival have limited ability to implement continuous improvement of their environmental performance. The recreational sector's ability to support fisheries ESD is more dependent on social factors, such as fishers' awareness of best environmental practice for recreational fishing and preparedness to carry it out. This too presents management agencies and other entities capable of influencing recreational fishers' activities with major challenges if recreational fishers are to contribute effectively to ecologically sustainable fisheries management.

As ESD factors run through so many dimensions of society, an integrated approach to ESD is essential, for reasons that include:

- the need to look at use of Australia's ecological, economic and social resources on a regional, national and international basis; and
- the significance of potential threats to our environment and economy if we do not take action.

ESD has become a major objective of the fisheries legislation of most jurisdictions. A key component is the need to measure and report performance against ESD objectives. Setting sustainable levels of fishing has been central to fisheries management and science for a long time. The concept of ESD, however, is far broader than the traditional focus on yields derived from target species. This complexity poses difficulties for fisheries managers, partly because of the poor understanding of how fisheries ecosystems work and how they are affected by use or other disturbance or economic activity.

### Main environmental issues

Recreational and sport fishing takes place throughout the continent and in its offshore waters. Estuaries and protected marine waters are the most popular fishing locations. Significant fisheries effort also occurs on ocean beaches, rocky headlands and offshore demersal reefs, usually within 20 nautical miles of the coast. Offshore pelagic fish are caught up to 50 nautical miles offshore. Freshwater fishing is for native fish, salmonids and introduced coarse fish.

The major difference between managing commercial wild-catch fishing and recreational fishing is that the former has limited entry whereas the latter has open access to fisheries resources. The result is that, even with input controls, increasing participation will cause recreational fishing effort to continue to rise. Household food consumption surveys undertaken by the Australian Bureau of Statistics suggest that the total recreational catch of all seafood may be of the order of 30 000 tonnes — about the same as the commercial catch from the South East Fishery, Australia's highest tonnage commercial fishery.

Despite fisheries management controls being placed on recreational fishing through catch and size limits, policing and compliance management are more difficult than in the commercial sector. Whereas commercial fishing is subject to both compliance and reporting, recreational fishing is subject only to compliance. Moreover, people who go fishing regard the activity as private, and most have little knowledge of fisheries management.

The consequences of this shortcoming have been magnified in recent times by easier access to remote fishing locations as a result of greater availability of offroad vehicles, bigger and better boats, better roads, and improved fishing technology. This has also increased the pressure on fish stocks once protected by their isolation.

To promote ecologically sustainable fishing practices, the recreational sector like the commercial sector — has developed and promoted a voluntary code of conduct. Its effectiveness is limited by the largely private nature of the activity and by the large numbers of recreational fishers who do not realise their responsibilities. Many TV fishing programs, fishing publications and tourist guides advocate catch-and-release fishing, although the effectiveness of this practice is still unclear.

In recent years, there has been increasing realisation that to ensure that fisheries ecosystems are sustainable, habitats must be protected in a holistic way. An important requirement is to maintain the integrity of "chains of critical habitats" for the survival of species. Critical habitats are habitats that, at various times in a fish's life-cycle, are essential to its existence. Because critical habitats may vary as the fish matures, it is appropriate to consider them as parts of a chain rather than as isolated entities. When even one critical habitat is degraded, production from the whole chain is affected. Moreover, when a species is dependent on another (in food chains at sea, for example), vulnerability of the critical habitat of a predated species can affect the predator species.

Before the impacts of recreational fishing can be understood, and before that understanding can be translated into good fisheries management, appropriate catch data must be collected. This is particularly important where species are subject to commercial or traditional catch in addition to recreational catch. For this reason, governments have recently made efforts to measure the level of catch taken through recreational fishing, including through the National Recreational and Indigenous Fishing Survey, which is due to publish its findings in late 2001.

#### Access to wild-fish resources

The commercial, recreational and traditional sectors have certain rights to fish resources, although the nature of the rights varies from fishery to fishery. Governments exercise a stewardship role in relation to fisheries resources on behalf of the Australian community.

The need to have objectively based, secure access to fisheries natural resources for all three sectors of the fishing industry is one of the main issues confronting the industry today, and has been nominated by the FRDC as one of nine industry challenges that will be important in the next 20 years. The FRDC's R&D plan 2000–2005 makes the following predictions about resource access:

- In future, more than ever, fisheries management will be a partnership between all stakeholders empowered to develop pragmatic decisions that provide benefits to the Australian community. Tensions over access between the commercial, recreational and traditional sectors of the industry and between these industry sectors and non-fishing influences will intensify unless there is consistency in allocation of access. The three sectors will also need to adopt a collaborative approach to recognising and resolving non-fishing influences.
- Creation of marine protected areas (MPAs) that exclude fishing or impose other restrictions on the fishing industry will result in a significant proportion of the coastal zone being assigned a high degree of protection. Nations will establish targets, such as 20 per cent coverage of coastal zones, by 2020. Creation of an MPA will not necessarily be based solely on science but will also be a response to social and political factors. The fishing industry will need to take a leadership role in working within structures such as the National Representative System of Marine Protected Areas to ensure that MPAs are created in a way that underpins sustainable development of the industry.
- Re-allocations of access from commercial to recreational and traditional fishing will continue. Commercial fishing is likely to be stopped in some freshwater and coastal fisheries. Compensation will be one of the incentives for commercial fishers to hand over access to resources. Litigation is likely to increase because of the difficulty of obtaining agreement about allocation.
- Animal welfare activists may start to have an impact on fishing, particularly sport fishing and catch-and-release fishing.
- Recreational fisheries management will expand into tourist ventures associated with recreational fishers, such as chartering, leading to more diverse activities than in the past.
- In some areas, the growing population of recreational fishers may give rise to difficulties in controlling the number of fish that can be caught in a sustainable manner particularly in breeding and nursery grounds. Regulation will be needed to protect fish stocks and their habitat from over-use, ensuring that they remain available for the enjoyment of everyone now and in the future. Consequently, recreational fishing licences, and probably fees, will become the norm (as they are for the commercial sector) as governments recognise that such practices are a necessary component of effective management.
- The extent to which the *Native Title Act* will affect the fishing industry is not clear. However, it is clear that demands by Aboriginal and Torres Strait Islander people for recognition of their native title to fisheries will intensify. Further exemptions from the application of fisheries laws to Aboriginal and Torres Strait Islander people may ensue. Demands for enhanced rights by commercial and recreational fishers may also intensify fisheries-related native title claims.
- In many re-allocation scenarios, scientific considerations will be over-ridden by political decisions as a result of vocal and skilful political lobbying. Catch data by sector is required to facilitate wise decision-making, particularly where species are sought by more than one sector.
- All three sectors of the fishing industry will need to increase their sector's political and community profile in the interests of their prosperity and resilience, and of their claims to use the natural resource. Essentially, this will be achieved by developing capabilities to educate the community and

governments about key industry and product factors, and about community benefits.

Allocation of access to wild-fish resources between sectors and non-fishing activities is complex and involves the application of environmental, economic and social (including political) information. Recfish Australia supports the FRDC's call for uniform approaches throughout Australia; acknowledges the need for effective co-management in fisheries management to address the allocation of access of fisheries resources among the three industry sectors; and acknowledges the need to include non-fishing community values and interests in co-management arrangements.

#### Findings of recent reviews of fisheries natural resources

The FRDC has recently funded national reviews of fisheries research priorities, which brought together authoritative statements of the condition of fisheries environments, identified key knowledge gaps and suggested research needed for management responses to those gaps. This identification of issues has provided valuable guidance for setting Recfish Australia's R&D priorities. Some key points are as follows.<sup>4</sup>

Most known human impacts on the aquatic environment occur along the coastal fringe, especially near concentrations of population and freshwater resources. This is also where most recreational and sport fishing takes place.

The FRDC-funded study of marine ecosystems that concluded in 1999, *A Review and Synthesis of Australian Fisheries Habitat Research*, identified the following nation-wide pressures on the environment as directly due to recreational and sport fishing:

- widespread retention of under-sized fish;
- bycatch practices and discarding during fishing and bait collection (castnets, baitnets);
- chronic littering at popular localities;
- habitat degradation by boat, foot and vehicular traffic;
- lack of "ownership" of problems by members of the recreational sector;
- implication of anglers in the spread of carp and tilapia pests; and
- on exposed rocky and sandy coasts and sub-tidal coral and rocky reefs, harvesting of invertebrates and algae for food and bait.

The FRDC study of freshwater resources that also concluded in 1999, Issues affecting the sustainability of Australia's freshwater fisheries resources and identification

Further information is in Recfish Australia's 2000 Environmental Strategy; Research Priorities for Ecosystems Protection (summary publication) and other reports (hard copy and CD-ROM) from FRDC project 1995/055, 'Review and synthesis of Australian fisheries habitat research', Australian Institute of Marine Science; FRDC project 1997/142, 'Issues affecting the sustainability of Australia's freshwater fisheries resources and identification of research strategies', University of Canberra; and A. McIlgorm & J. Pepperell 'A national review of the recreational fishing sector — a report by Dominion Consulting to Agriculture, Forestry and Fisheries – Australia', AFFA, Canberra, 2000.

*of research strategies,* identified six major pressures on the sustainability of inland fisheries:

- habitat degradation;
- pollution, water quality and water temperature;
- reduced environmental flows;
- barriers to fish migration;
- effects of introduced species; and
- fishing.

This study also identified direct effects of recreational and sport fishing on freshwater environments as:

- removal of targeted species and consequent reduction in population sizes and biodiversity;
- introduction and translocation of exotic species;
- translocation of native species outside their normal range;
- tramping of riparian areas and wetlands; and
- overfishing of crustaceans.

The *Review* referred to environmental pressures in the following terms:

Australia's ocean and atmospheric climate and landscapes are dominated by extreme events and environmental variability that produces major effects on fisheries habitats and fisheries production. These natural dynamics are poorly understood for most habitats. The major disturbances to fisheries habitats due to human activity are clearly from land use and urbanisation in the coastal zone and from the effects of fishing on the waters of the continental shelf. The major coastal zone problems are often amenable to conservation and rehabilitation approaches and are of high priority. However, the greatest long-term threat may come from introduced pests and diseases for which the likelihood of spread is high, control or management is very expensive and the chances of eradication are minimal.

Changes in drainage, habitat destruction and degradation, nutrient inputs, contaminants and introduced pests and diseases are all diverse and major pressures on coastal and aquaculture environments. They are usually interlinked and effects are often cascading. For example, sewage inputs of nutrients are always accompanied by contaminants, and introduced pests apparently gain firm establishment in disturbed areas. The diversity of pressures is highest close to centres of urbanisation, but even in remote areas a widespread and growing threat to fisheries habitats in estuaries and coastal streams is freshwater diversion and blockages to access by tides and aquatic fauna and flora.

The *Review* identified the activities need to respond effectively to the pressures on estuarine and marine environments:

There is a need to document, understand and reduce the various effects of harvesting and aquaculture on the environment. FRDC sponsored research has seen major advances in understanding of the threat of trawling to seabed communities, and subsequent development of trawl gear that avoids bycatch and damage to seabed communities. This could be profitably extended further to recognise and address the role of these industries in the spread of pests and diseases, by developing education programs and industry practices and technologies that minimise spread amongst ports and aquaculture facilities. Vigilance is needed to prevent further introductions and make fisheries values better recognised in assessments of imports for the aquarium trade and other industries.

Declarations of marine protected areas such as the proposed National Representative System of Marine Protected Areas (NRSMPA) can be seen both as a challenge and an opportunity to fisheries in all environments. The spatial zoning affords protection from harvesting for some species and some opportunities for research and monitoring of contrasts in fishing effort. The opportunities for suitable fisheries habitat protection from marine protected areas depend strongly on having the relevant fisheries-related information.

The following priorities for restoring and rehabilitating fisheries habitats were proposed:

Pressures on fisheries habitats comes from a diverse assemblage of resource users, ranging from coastal developers with interests in mangrove reclamation, to agricultural developers of floodplains, to freshwater resource users and the producers of wastewater streams.

To help protect and restore fisheries habitat values in these cases (e.g. areas disturbed by catchment use and coastal development) it will be imperative to harness economic forces outside of fisheries interests. This could mean financial incentives for on-farm wetland rehabilitation such as tax incentives and rate relief. Adaptive R&D in rehabilitating habitats can also serve to fill strategic gaps in knowledge of life histories and fisheries-habitat links.

There is an urgent need to develop priorities, techniques and monitoring programs for rehabilitation efforts in lower catchments — such as fishways — to restore some fisheries production in disturbed estuaries and wetlands. The same information is needed to aid the implementation of "no nett habitat loss" policies with positive, measurable outcomes for fisheries production.

To have the best chance of converting R&D in coastal habitats into management outcomes there needs to be a clearer link to improving management action and decision making. Vehicles for change include integrated catchment management approaches and regional planning exercises. This is essential in the coastal zone mosaic of legislation, jurisdiction, resource use and current trends in population growth, coastal development and demands for water resources.

The strategies for Program 1, Natural Resources Sustainability (page 31), embody Recfish Australia's responses to the priorities suggested by the foregoing national reviews, among other things.

### **Social context**

Australians enjoy a wide range of recreational fisheries — from the northern estuaries for barramundi, to southern waters for snapper and the highly prized King George whiting, and inland waters for trout and native fish. The majority of catch is from inshore and estuarine waters. For some species, the size of the recreational catch exceeds the commercial catch.

The number of people who fish recreationally (inland, in estuaries, off beaches and in the seas) represents about 25–30 per cent of all Australians — in all, more than 5 million. About 15 per cent of these people fish regularly on 20 or more days per year. Within this 15 per cent, twice as many males than females are involved.

For most people, the major reason for recreational fishing is relaxation. Obtaining fish for food is a lesser, though important, consideration. Indeed, many recreational fishers place the benefit of experiencing fishing well above the benefit of making a catch.

In addition to their value as sources of food, fisheries resources are valued by the community in many other ways. For example, they have values deriving from people knowing that the environment and the diversity of species are maintained and that fisheries resources exist. The aquatic environment is increasingly being used by people — particularly tourists — who do not capture the resource but simply enjoy it. Similarly, many people place a very high value on being able to take their children fishing and knowing that the fish will be there for another generation. Many jobs supporting recreational fishing exist because of these values.

The National Recreational and Indigenous Fishing Survey, under way at the time this plan was prepared, will provide a large amount of information about the social contexts of recreational fishing. The information will be invaluable for framing policies and further R&D investigations.

### **Political factors**

The recreational sector expresses its views in the political arena through a number of associations, including Recfish Australia as the peak body and one of the FRDC's two representative organisations. However, like the commercial sector, the recreational sector's political and self-representational activities concentrate mainly on state bodies and viewpoints. Despite greatly increased influence in the states, concentration on national interests and the coordination of national or multi-state issues has been reduced.

Competition for resource access between the recreational and commercial sectors has led elements of the one sector to lobby for greater access than the other sector. At peak body level there is a generally constructive approach to sharing fisheries resources and resolving common environmental issues. The recreational sector is advocating comprehensive collection of data on economic, environmental and social dimensions of fisheries on which to base decisions for the common good.

The recreational sector and the industries that it supports and affects add up to a very large number of voters. Participants are particularly vocal where bay, inlet and estuarine fisheries are near large cities. Awareness of the lobbying power of its extremely large membership is reflected in car bumper stickers: "I fish and I vote". The sector's leaders are well aware of the sensitivities of rights of access to fisheries resources.

### Safety

As with commercial wild-catch fishing, some forms of recreational fishing are known to be hazardous, although statistics are not generally available. Improved personal safety equipment is becoming available, but there are many barriers to higher adoption of safety practices. Among them are generally inadequate communication, a certain bravado among some participants, and a reluctance by most people to think about unpleasant possibilities arising from relaxing activities. The sector has responded to high death rates among recreational rock fishers by placing life-buoys where the risk is high. Two states have legislated to make wearing of life-jackets compulsory for children aboard boats.

### **Economic context**

The National Recreational and Indigenous Fishing Survey will provide a large amount of information about individuals' expenditure on recreational fishing that will be invaluable for increasing understanding of economic factors applying to the sector, and for devising appropriate policies. This information will be especially useful in determining the basis for sharing fisheries resources.

From other surveys, it is already known that significant economic benefits from recreational fishing flow to many regional areas — including jobs in the tourism, tackle, boating, and charter industries. Charter boats support game fishing, estuarine and coastal fishing, skin-diving and whale-watching activities, and there is a diverse boat-hire and service industry. These industries support others. For example, of the 3.8 million international tourists visiting in 1996, some 12 per cent (450 000) participated in diving activities, 3 per cent (115 000) participated in fishing activities, and 2 per cent (75 000) in whale-watching. One estimate of annual direct, indirect and capital expenditure on recreational fishing is \$2.9 billion, broken down as 20 per cent direct (for example, tackle and bait); 50 per cent indirect (for example, travel, accommodation); and 30 per cent capital (for example, boats).<sup>5</sup> Employment from national recreational fishing expenditure is conservatively estimated at between 27 000 and 54 000 jobs nationally, using expenditure multiplier estimates.

Two immediate needs are to develop objective methods for making valid comparisons between economic factors applying to the different sectors of the fishing industry, and for resource sharing between sectors in combination with catch controls. These needs have been addressed in R&D projects nominated in this plan.

### Policy and legislative context

Reflecting its role as the peak national body for recreational fishing, Recfish Australia participates in a wide range of bodies that develop policies affecting the recreational sector and/or the wider fishing industry. The bodies include:

- Agriculture Fisheries and Forestry Australia (AFFA):
  - Sustainable Development Reference Group of the Australian and New Zealand Standing Committee on Fisheries and Aquaculture
  - Shark Advisory Group National Plan for the Conservation and Management of Sharks
  - National Carp Task Force
  - Biosecurity

<sup>5</sup> Source: A. McIlgorm & J. Pepperell, 'A national review of the recreational fishing sector — a report by Dominion Consulting to Agriculture, Forestry and Fisheries – Australia', AFFA, Canberra, 2000.

- Australian Fisheries Management Authority (AFMA): Small Pelagic Working Group
- Environment Australia (EA)
- Land and Water Australia (LWA)
- Fisheries Research and Development Corporation (FRDC)
- Other fishing-related environmental programs and bodies:
  - Fisheries Action Program
  - Coastcare

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- National Landcare Program
- National Rivers Consortium
- Bushcare
- Biodiversity network
- National Rivercare Program
- National Wetlands R&D Program
- Waterwatch
- Coast and Clean Seas

A very wide range of legislation affects the way in which Recfish Australia and other recreational fishing organisations and individuals conduct their activities. The main legislation is shown in appendix 3.

### **Extension context**

Ultimately, R&D is only worthwhile if the outcomes are actually adopted by beneficiaries or lead to further research to resolve an outstanding issue. The low level of resources possessed by the recreational sector poses a significant risk to effective extension of R&D results — that is, the communication of new knowledge, processes and technologies to the industry, potential beneficiaries and other stakeholders. It is therefore particularly important that R&D projects conducted in accordance with this plan include effective extension components within the projects themselves. The same principle applies to adoption strategies for new knowledge, processes and technologies derived from R&D.

Because it is only when knowledge, processes and technologies deriving from R&D are "dipped into" as a public resource that their inherent practical value is witnessed, Recfish Australia will place a high priority on extension and adoption activities. To do so effectively requires a communication strategy to be developed.

### Significance of change

The physical, social, economic, policy and R&D factors in Recfish Australia's business environment are characterised by continuous change.

Government funding cycles are usually three years long, but priorities can change more quickly. Moreover, new information will often require R&D actions to be adjusted. And in everyday operations, unpredictable events require flexible management. The recreational sector must therefore anticipate and respond quickly to change in seeking always to maximise the effectiveness of its actions.

### **Review of this plan**

This plan will be reviewed at annual general meetings of Recfish Australia, usually held in October. Suggestions for amendment from organisations and individuals, which are welcome at any time throughout the year, will be addressed during this annual review.

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## STRATEGIC ELEMENTS OF R&D IN SUPPORT OF RECREATIONAL FISHING

### Why focus on outcomes?

The strategic elements of this plan are based on concepts of outcomes, outputs, inputs and strategies — for two reasons:

- Making a clear distinction between outcomes and outputs encourages R&D to be focused on real change in the environment, rather than on the goods and services produced by R&D.
- Governments are adopting outcome / output frameworks. Being compatible with them improves the efficiency of R&D that supports the recreational fishing sector.

Good outcomes can only be achieved through good R&D outputs.

### Definitions

Outcomes are the *results, impacts or consequences* of R&D activities on the fishing industry and Australia's economic, environmental and social resources.

Outputs are the *goods and services* (mainly knowledge, processes and technology) that R&D entities produce for other organisations or individuals.

Inputs are *resources* — in the form of people, expertise, materials, energy, facilities and funds — used in activities that produce outputs.

Strategies focus R&D activities to produce outputs.

### Priority-setting for recreational fishing R&D

As the peak national body for the recreational sector of the fishing industry, Recfish Australia is consulted regularly to establish priorities for R&D that addresses outcomes specific to the recreational sector or when other R&D has implications for recreational fishing.

The Fisheries Research Advisory Bodies (FRABs), which cover the fisheries of the Commonwealth, each state and the Northern Territory, include recreational fishing experts or representatives of state-based member organisations of Recfish Australia. These persons nominate priorities for recreational fishing during the FRABs' priority-setting process and when R&D applications are invited.<sup>6</sup>

At a national level, the FRDC has a need for coordination of national R&D priorities in support of recreational fishing, especially when commissioning research or when an R&D application is to be solicited. The need is greatest with nationally significant issues that are not always reflected in the priorities established by state and territory bodies. In such instances, the FRDC consults with Recfish Australia.

<sup>6</sup> The roles of the Fisheries Research Advisory Bodies are described on page 136 of the FRDC's R&D plan.

When considering its priorities for recreational fishing R&D and discussing them with other entities, Recfish Australia seeks to integrate them with priorities of other sectors so that R&D and other initiatives are not duplicated.

R&D applications from the recreational sector, including those with national implications, are normally submitted through the Fisheries Research Advisory Bodies.

### **Program 1: Natural Resources Sustainability**

### **Planned inputs**

The principal inputs will be specified in each R&D proposal.

#### **Planned outcome**

The planned outcome for Recfish Australia's Natural Resources Sustainability Program is as follows:

• Australian marine and freshwater resources and habitats are managed sustainably to produce abundant, diverse, high-quality fishing experiences for recreational and sport fishers.

Note: Elements of this program incorporate two of the five goals of the 1994 National Policy for Recreational Fishing, as listed on page 41.

### **Planned outputs**

Planned outputs for this Program are knowledge, processes and (as applicable) technologies that contribute to achieving the Program's planned outcome.

### **Strategies**

R&D leading to the planned outcome for natural resources sustainability will be conducted in accordance with the following strategies.

Note: Examples of projects have been added to illustrate in a practical way the types of R&D that could be conducted under each strategy. As they are only indicative, they should not be interpreted as reflecting preferred areas for actual R&D.

#### Fish biology

Strategy 1: To increase and apply knowledge of the biology of fish and their ecosystems.

Indicative examples of project topics:

For important recreational fish, research on:

- population structure and genetics;
- growth rate;

- age and size at sexual maturity;
- sexual dimorphism;
- distribution; and
- migratory patterns.

#### Interactions between fish and their ecosystems

*Strategy 2: To increase and apply knowledge of interactions between fish and their ecosystems.* 

Indicative examples of project topics:

- understanding chains of critical habitats for recreational species;
- identifying environmental drivers that enable predictive population / ecological modelling for key target species;
- increasing knowledge of predator-prey relationships for important recreational species;
- understanding the role of small pelagic fish and their importance to animals higher in the food chain, especially in the context of catastrophic events;
- understanding the role of various habitat types on fish populations; and
- identify key indicators for habitat / ecosystem types.

#### Effects of fishing activities on fish and their ecosystems

Strategy 3: To increase and apply knowledge of the effects of fishing activities on fish and their ecosystems.

Indicative examples of project topics:

- determining the impacts of commercial, recreational and traditional fishing on juvenile recreational species, the food chain and habitats important for recreational species;
- assessing the impact of fishing on aggregated stock during spawning periods;
- identifying fishing-related threats to endangered and threatened species;
- assessing the impact of prawn drag nets on juvenile species;
- estimating the level of post-release mortality and ways to reduce it, and variation in mortality by species, gear, area etc; and
- identifying bycatch issues and ways to reduce bycatch, and educating fishers in appropriate practices.

## Effects of non-fishing activities, pests and pollution on fish and their ecosystems

Strategy 4: To increase and apply knowledge of the effects of non-fishing activities, pests and pollution on fish and their ecosystems.

[Includes effects of aquaculture on ecosystems.]

Indicative examples of project topics:

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quality and biota, including fish population and stock structure, and devising ways to reduce them;

- establishing the minimum environmental flows to maintain healthy fishrelated ecosystems within rivers;
- establishing the prevalence of introduced organisms on boats of all sizes, and their impacts;
- understanding the impact of cane toads on fish stocks and researching a possible virus or other biological control for cane toads; and
- studying the impact on fish of agricultural activities and run-off.

#### Health of fish and their ecosystems

Strategy 5: To increase and apply knowledge of the health of fish and their ecosystems.

Indicative examples of project topics:

- developing methods to reduce disease and pest transfer through translocation of species to new areas;
- establishing the relationship of diseases from aquaculture, aquarium fish, ballast water etc on stocks of recreational fish species and the ecosystems that support them;
- identifying key habitats used by fish during their life cycle; and
- identifying bio-indicators for the health of ecosystems.

# Rehabilitation and enhancement of fisheries and their ecosystems

Strategy 6: To increase and apply knowledge of rehabilitation and enhancement of fisheries and their ecosystems.

Indicative examples of project topics:

- evaluating the effectiveness of artificial habitats, including artificial reefs;
- evaluating the effects of manipulating flows on fish habitats by opening weir floodgates and removing barriers;
- evaluating removal of sediment or dredging entrance channels as a rehabilitation tool;
- investigating methods of improving water quality entering waterways from stormwater and run-off;
- restoring habitat by re-snagging and by rehabilitating riparian, seagrass and mangrove areas; and
- evaluating the impacts of introducing aquatic food, including forage fish, and considering genetic issues and the potential introduction of disease.

#### Legislative, institutional, compliance and policy arrangements and their impacts

Strategy 7: To increase and apply knowledge of legislative, institutional, compliance and policy arrangements and their impacts.

Indicative examples of project topics:

- evaluating community understanding of environmental instruments and their impacts;
- evaluating the responses of stakeholders to environmental instruments in management and the flow-on effects on stocks;
- communicating to the wider Australian community the range of environmental instruments and their application to recreational fishing;
- reviewing the impacts of shared jurisdictions on effective management; and
- investigating the credibility of fisheries management objectives.

#### Stock assessment

*Strategy 8: To increase and apply knowledge of stock assessment methods.* 

[Excludes routine assessments that are the core responsibility of other agencies.]

Indicative examples of project topics:

- incorporating recreational catch within fisheries stock assessments;
- establishing performance criteria that are inclusive of all aspects of the fishery, and developing suitable indicators for recreational fishing; and
- developing methodologies for collecting robust, appropriate, cost-effective time-series data.

#### Fisheries and ecosystems management

Strategy 9: To increase and apply knowledge of fisheries and ecosystem management systems and their evaluation.

Indicative examples of project topics:

- evaluating the impact of management tools on resource sharing and fisheries management on recreational fish resources, including the effects of marine protected areas on recreational fishing and fisheries resources;
- examining fisheries management options for recreational fisheries; and
- developing practical, effective management tools, including those deriving from best practice overseas.

#### Key performance indicators

Explicit key performance indicators are specified in each R&D project proposal.

In the Natural Resources Sustainability Program, performance indicators fall into two categories:

- *The status of fish stocks.* This relates to how sustainable are the catches of particular species. R&D project proposals may specify, for example, indicators of the effectiveness and efficiency of harvesting and other management strategies.
- The health status of the environment that sustains all aquatic life. This relates to fishing activities affecting the environment and, conversely, environmental effects (both human-related and natural) on fish and their ecosystems. R&D

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project proposals may specify, for example, indicators of the economic, environmental and social components of ESD.

Measurable achievement of outcomes depends on the extent to which a number of entities adopt R&D project outputs; on non-R&D factors (for example, economic, social and political); and on the extent to which change can be measured. Recfish Australia will encourage other entities to adopt R&D results.

### **Program 2: Community Stewardship and Recreational Sector Development**

### **Planned inputs**

The principal inputs will be specified in each R&D proposal.

### **Planned** outcomes

The planned outcomes for Recfish Australia's Recreational Sector Development Program are as follows:

- The recreational sector of the fishing industry develops in ways that maximise social, environmental and economic benefits to recreational and sport fishers, associated businesses and the Australian community.
- The skills of people in the recreational sector are developed and used to achieve sustainable fishing practices, to enable fishers and their organisations to participate effectively in sustainable fisheries management, and to enhance the recreational sector's development.
- Partnerships are developed between governments, the recreational fishing community and associated industries to enhance the values of recreational fisheries throughout Australia.

Note: Elements of this program incorporate three of the five goals of the 1994 National Policy for Recreational Fishing, as listed on page 41.

### **Planned outputs**

Planned outputs for this Program are knowledge, processes and (as applicable) technologies that contribute to achieving the Program's planned outcomes.

### **Strategies**

R&D leading to the planned outcomes for development of the recreational sector will be conducted in accordance with the following strategies.

Note: Examples of projects have been added to illustrate in a practical way the types of R&D that could be conducted under each strategy. As they are only indicative, they should not be interpreted as reflecting preferred areas for actual R&D.

# Economic and social values of the recreational sector and its impacts

*Strategy 1:* To increase and apply knowledge of economic and social values of the recreational sector and its impacts.

Indicative examples of project topics:

- evaluating the economic worth of "catch and release" fishing;
- developing suitable methods for allocating fisheries resources to recreational, commercial and traditional fishers;
- developing appropriate quality indicators for recreational fishing (for example, strike rates versus catch per unit effort);
- analysing angler satisfaction factors;
- developing management methodologies to address changes in values over time; and
- establishing an information base at national and regional levels to meet the needs of recreational fisheries management.

#### Access to fisheries resources

*Strategy 2:* To increase and apply knowledge of fishing and non-fishing activities affecting access to fisheries resources.

Indicative examples of project topics:

- facilitating decisions on resource sharing, including collecting data on economic and social values of resource users and identifying potential flow-on effects of resource-sharing decisions;
- developing tools and processes to determine fair and reasonable allocation of Australian fisheries resources to recreational fishers, taking into account the needs of other users;
- quantifying recreational catch by analysing and categorising existing survey and census information into species, catch-and-effort and geographical data;
- determining the impacts and effectiveness of existing recreational gear restrictions on catch;
- determining the social and economic issues in changing resource allocation;
- developing more effective mechanisms for consultation with the traditional sector; and
- researching management regimes to address local depletions of fish stocks, including bait fish.

#### Health and safety associated with fishing activities

*Strategy 3:* To increase and apply knowledge of health and safety associated with recreational fishing activities.

Indicative examples of project topics:

• developing operating standards for charter operators;

- determining ways to assess the risks to water quality objectives of recreational fishing activities; and
- assessing the possible contribution of more uniform standards for the safety of recreational fishers and other users of the resource.

#### Catch care, food safety and consumer health

Strategy 4: To increase and apply knowledge of catch care, food safety and the health benefits of seafood consumption.

Indicative examples of project topics:

- developing a national biotoxin monitoring program for shellfish collection by recreational fishers; and
- assessing the health risk of consuming a species of fish.

#### Leadership development

Strategy 5: To develop leadership among people in, and supporting, the recreational sector.

Indicative examples of project topics:

- developing and delivering training and development packages for present and future industry leaders; and
- developing and implementing mentoring and other developmental programs, such as involving potential leaders in fishcare programs to improve their knowledge of recreational fishing issues.

#### Vocational development

Strategy 6: To develop the skills of people in, and supporting, the recreational sector.

Indicative examples of project topics:

- developing and delivering training and development packages for people in, and supporting, the recreational sector; and
- developing and delivering training packages to assist understanding of scientific assessment processes.

#### **Community education**

Strategy 7: To develop knowledge in the community about fisheries resources and the recreational sector.

Indicative examples of project topics:

- devising strategies for communicating the values of recreational fisheries (including to political entities) with the aim of fostering the motivation to manage them and encouraging involvement in their management;
- determining perceptions of governments and fisheries management agencies etc., and communicating key messages relating to those perceptions;
- evaluating the outcomes achieved by the sector's educational programs;

- providing information on matters relating to recreational fishing (such as on the ethical issues of live-baiting) for use in educational curricula;
- disseminating information on factors affecting fisheries sustainability;
- extending food safety knowledge, including that from the commercial sector; and
- investigating the means of extending knowledge to the great majority of recreational fishers who are not fishing club members and to those who do not regularly read recreational fishing publications.

#### Community involvement and stewardship

*Strategy 8: To involve the community in ways that will benefit Australia's fisheries resources and the recreational sector.* 

Indicative examples of project topics:

- determining the means of establishing a funding base to effectively manage the nation's recreational fisheries;
- determining the means of funding a national peak representative body for the recreational sector;
- developing community stewardship of fisheries natural resources, including ways to involve communities in reducing human impacts on coastal floodplains;.
- evaluating the outcomes achieved by the sector's community involvement and stewardship programs;
- developing the means for improved sector self-management and comanagement of fisheries, including through investigating the effectiveness of codes of practice and of their dissemination;
- developing and using databases so that data fragmentation and loss is avoided.

### Key performance indicators

Explicit key performance indicators are specified in each R&D project proposal.

In the Recreational Sector Development Program, performance indicators fall into four categories:

- *Economic factors.* These factors relate to economic factors related to recreational fishers and the profitability of businesses associated with the recreational sector.
- Social factors. These factors relate to the recreational sector being forwardlooking, innovative and socially resilient. Examples are indicators of employment deriving from the industry, and other social factors such as values placed on recreational and traditional fishing.
- *Improvement of people*. This relates to improvement in the capabilities of people who are members of the recreational sector or who work in support of it. Examples are indicators of leadership, performance and innovation.

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• Community involvement and stewardship. This relates to how the community supports the recreational sector and the natural resources on which it depends. Examples are indicators of community awareness of fisheries natural resources and their sustainability; community involvement in fisheries and their management; and consumption of seafood harvested by recreational fishers.

Measurable achievement of outcomes depends on the extent to which a number of entities adopt R&D project outputs; on non-R&D factors (for example, economic, social and political); and on the extent to which change can be measured. Recfish Australia will encourage other entities to adopt R&D results.

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## Appendix 1: The goals and principles of the National Policy for Recreational Fishing

Source: Recreational Fishing in Australia: a National Policy. National Steering Committee on Recreational Fishing. ISBN 0 7309 6433 7. Department of Primary Industries and Energy [now Department of Agriculture, Fisheries and Forestry – Australia]. Canberra, 1994.

### Five goals for recreational fisheries

[Page 1 of the National Policy document]

Five primary goals flow from the 16 guiding principles which form the basis for this national recreational fishing policy.

- 1. To ensure quality fishing, and maintain or enhance fish stocks and their habitats, for present and future generations as part of the environmental endowment of all Australians.
- 2. To develop partnerships between governments, the recreational fishing community, and associated industries to conserve, restore and enhance the values of recreational fisheries throughout Australia.
- 3. To allocate a fair and reasonable share of Australian fish resources to recreational fishers, taking into account the needs of other user groups.
- 4. To establish an information base at national and regional levels to meet the needs of recreational fisheries management.
- 5. To establish a funding base to effectively manage the nation's recreational fisheries.

*Note*: The five goals have been incorporated in this R&D plan as follows:

- Goal 1: the planned outcome for Program 1;
- Goal 2: the third planned outcome for Program 2;
- Goal 3: a project under Program 2, Strategy 2;
- Goal 4: a project under Program 2, Strategy 1; and
- Goal 5: a project under Program 2, Strategy 8.

### Key principles for recreational fishing

[Page 3 of the National Policy document]

1. Recreational fishing should be managed as part of the total fisheries resource

to ensure quality fishing, and to maintain fish stocks and their habitats, for present and future generations of Australians.

- 2. Our aquatic habitats and ecosystems are part of the environmental endowment of all Australians, and are the key to a healthy fisheries resource which requires protection, restoration and enhancement.
- 3. Government, in its stewardship role, must encourage and assist the community to be involved in all aspects of fisheries management.
- 4. Recreational fishers and the recreational fishing industry should participate in the protection and management of their fishing heritage to ensure that it is available for future generations.
- 5. Community consultation at Federal, State/Territory and local levels should be a key component of recreational fisheries management programs.
- 6. Recreational fishers are entitled to a fair and reasonable share of Australian fish resources taking into account long-term sustainable yields; the rights and entitlements of others; and the need to optimise community returns from available stocks.
- 7. Recreational fishers throughout Australia should be encouraged to adopt their own Codes of Practice consistent with the goals of this policy.
- 8. Preference should be given to recreational fishing methods in which the fisher is present and which aim to catch target species.
- 9. The catching of fish for sale or profit, including barter, by recreational fishers is unacceptable.
- 10. Programs, consistent with the goals of this policy, which seek to increase recreational fishing opportunities throughout Australia should be encouraged.
- 11. Reasonable physical access to recreational fishing areas should be provided for throughout Australia.
- 12. Community awareness, education and enforcement programs should focus on encouraging positive changes in community attitudes to develop a stronger conservation ethic.
- 13. The economic, educational, health and other social benefits of recreational fishing should be widely recognised and actively promoted.
- 14. Fisheries management decisions should be based on sound information including fish biology, fishing activity, catches, and the economic and social values of recreational fishing.
- 15. Adequate funding and support should be provided to manage recreational fishing as part of integrated resource and environmental management strategies.
- 16. Recreational fishers should continue to contribute to the cost of managing and developing recreational fishing.

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# Appendix 2: Recfish Australia's objects

The main object of the Confederation is to encourage and promote the sport and recreation of recreational fishing, and:

- (a) to allow the members to confer and speak and make submissions and representations on matters of national and international importance to recreational fishing;
- (b) to assist or make representations and submissions on behalf of members in the furtherance of these objects and for the benefit of recreational fishing;
- (c) to promote liaison and cooperation between national recreational fishing organisations;
- (d) to promote and sponsor the study of recreational fishing;
- (e) to promote and sponsor the scientific study of, conservation and management of fish, their environment and ecology;
- (f) to open and maintain communication and discussion with relevant Commonwealth, State and Local Governments, departments and agencies and with scientific institutions and allied organisations within Australia and internationally;
- (g) to disseminate information and knowledge of scientific work on recreational fishing and fish to members, governments, scientific bodies and the general public;
- (h) to cooperate with national and international organisations with similar or allied interests;
- (i) to participate and assist in the collection, preparation and analysis of any information relevant to recreational fishing;
- (j) to represent, in Australia and overseas, its members at meetings, conferences or seminars relating to fishing as a sport and recreation or relating to the utilisation and management of fish species;
- (k) to encourage member organisations and their individual members to participate, where appropriate, in programs or scientific projects related to recreational and sport fishing and fisheries;
- (1) to promote legal and ethical recreational fishing;
- (m) to commission; contract and make grants to organisations and individuals for the purpose of research and education in matters relevant to recreational fishing and to fish, their conservation, environment and management;
- (n) to receive gifts, grants and subscriptions for the functioning or furtherance of the Objects of the Confederation;
- (o) in any way whatsoever, to assist members to do all such acts, deeds and things, including legal action, as may from time to time be necessary for the furtherance of these Objects.

## Appendix 3: Legislation and policies affecting Recfish Australia's stakeholders

#### Commonwealth and international

Fisheries Management Act 1991 Fisheries Act 1952 Fisheries Administration Act 1991 Fisheries Management Act 1991 Environment Protection and Biodiversity Conservation Act 1999 Primary Industries and Energy Research and Development Act 1989 Murray–Darling Basin Act 1993 Great Barrier Reef Marine Park Act 1975 Natural Heritage Trust of Australia Act 1997 Wet Tropics of Queensland World Heritage Area Conservation Act 1994 Recreational Fishing in Australia: A National Policy Offshore Constitutional Settlement Oceans Policy

### **States and territories**

WA:	Fish Resources Management Act 1994
Tasmania:	Threatened Species Protection Act 1995
SA:	Environment Protection Act 1993, Coast Protection Act 1972
Victoria:	Fisheries Act 1995, Flora and Fauna Guarantee Act 1988
NT:	Territory Parks and Wildlife Conservation Act 1998
NSW:	Threatened Species Conservation Act 1995, Fisheries Management Act 1994
ACT:	Environment Protection Act 1997, Fisheries Act 2000
Queensland:	Nature Conservation Act 1992, Fisheries Act 1994