Ocean Hauling Fishery

Environmental Impact Statement

Public Consultation Document

Published in January 2002 by
NSW Fisheries
Cronulla Fisheries Centre
PO Box 21 Cronulla NSW 2230

Details of the public consultation process and contact information are included on page A-15 in Chapter A (Volume 1)

Environmental Impact Statement on the Ocean Hauling Fishery

Public Consultation Document

NSW Fisheries, January 2002

ISBN 0 7310 9421 2

Cover images by J Matthews

DECLARATION

For the purpose of section 115K(4) of the Environmental Planning and Assessment Act 1979, the Director, NSW Fisheries is the person engaged as responsible for the preparation of this Environmental Impact Statement (EIS). The Director, NSW Fisheries is Mr Steve Dunn, BSc Hons Fishery Science (Plymouth), Master of Management (Macquarie). A range of NSW Fisheries staff and stakeholders with expertise and qualifications in fisheries management, environmental science, fisheries science and fisheries compliance assisted in the preparation of the EIS. Where expertise was not available within NSW Fisheries, external experts were contracted.

The EIS has been prepared on behalf of the persons who are entitled to operate in the Ocean Hauling Fishery (the proponents). A list of the proponents is contained in Appendix A1 of the EIS.

The address for the Director, NSW Fisheries, and for the proponents is:

C/o NSW Fisheries
Cronulla Fisheries Centre
PO Box 21
CRONULLA NSW 2230

The location of the proposed activity is described in Chapter C section 6(c). A description of the proposed activity and proposed controls is provided in Chapter C. An assessment of the environmental impact of the proposed activity as described in the draft Fishery Management Strategy is presented in the EIS in Chapters E through to I inclusive. The EIS contains all available information relevant to the environmental assessment of the activity to which the statement relates. The information provided in the EIS is neither knowingly false nor misleading.

VOLUME TABLE OF CONTENTS

Volume 1

Volume 2

Volume 3 *(Appendices)*

Volume 4 *(Consultants' Reports)*

CONTENTS AT A GLANCE

Table of Contents

List of Tables

List of Figures

Acknowledgments

NSW Fisheries would like to thank the many people who contributed substantial amounts of time and effort towards preparing this EIS, often within short timeframes.

The management planning and environmental assessment teams within NSW Fisheries have put in a great deal of dedicated work over the past 12 months, and numerous other departmental staff have made useful comments and suggestions on the drafts.

The members of the various advisory bodies who have received drafts of the fishery management strategy and EIS must be acknowledged. They have provided valuable and constructive feedback, often reading multiple draft documents. The Ocean Hauling Management Advisory Committee in particular has spent several meetings and much of the members' personal time reviewing and providing advice on the various drafts of the document. So too have the members of the following statutory Ministerial advisory councils, the membership of which is detailed on the following page:

Advisory Council on Commercial Fishing

Advisory Council on Recreational Fishing

Advisory Council on Fisheries Conservation

Fisheries Resource Conservation and Assessment Council

NSW Fisheries appreciates the timely and committed efforts of the consultants who reported on sections of the environmental assessment guidelines: Umwelt (Australia) Pty Ltd, Dominion Consulting Pty Ltd and SMEC Australia Pty Ltd. Thanks are also extended to the peer reviewers: Dr Ron West from the University of Wollongong, Dr Marcus Lincoln Smith from the Ecology Lab Pty Ltd, Dr Mark Fenton from James Cook University, and Dr David Godden from the Department of Agricultural Economics, Mr Lindon Coombs from the Department of Aboriginal Affairs.

Staff from Environment Australia, Planning NSW, National Parks and Wildlife Service, Department of Aboriginal Affairs and the Department of Land and Water Conservation also provided assistance in developing the document.

Membership on Advisory Boards

Ocean Hauling Management Advisory Committee

Janet Thomson (Chair)	Geoff Collett	Ron Prindable
Ted Allan	Roberta Dixon	Peter Ragno
Denis Brown	Paul Gibson	Darryl Sullings
Phillip Byrnes	Vince Jordan	(2 vacancies)

Advisory Council on Commercial Fishing

Ross Leader (Chair)	Megan Gallagher	Ron Firkin
Graeme Byrnes	Willis Sneesby	John Smythe
Paul Sullivan	George Baker	Shirley Massey
Bruce Korner	John Brierley	Barbara Radley
Ted Allan	Howie Davison	

Advisory Council on Recreational Fishing

Bruce Schumacher (Chair)	Anthony Moore	Lisa Terry
Mel Brown	Ann Lee	Mark Umbers
Peter Goadby	Elaine Garvey	Lionel Jones
Scott Mitchell	Terry Maloney	Graeme Moore
Tim Simpson	Margaret Dodson	Robert Cooper

Advisory Council on Fisheries Conservation

Prof. Alistair Gilmour (Chair)	Robert Toyer	Dennis Hicks
Dr Stuart Blanch	Dr Tim Anderson	Dr Jeff Leis
Dr Marcus Lincoln Smith	Allan Lyons	Steve Dunn
Peggy Svoboda	Valerie Taylor	

Fisheries Resource Conservation and Assessment Council

Richard Stevens (Chair)	Doug Joyner	Assoc. Prof. Stephan Schnierer
Prof. Tony Underwood	Margaret Dodson	Yolande Stone (Planning NSW)
Prof. Alistair Gilmour	Kathy Ridge	Angela Langdon (NPWS)
Bruce Schumacher	Mark Everson	Steve Dunn (NSWF)
Graeme Turk	Paul Elton * (DLWC) (replaced Grant Bywater from Oct 2001)	John Gallagher (replaced John Smythe from Dec 2001)

Abbreviations

ACCF	Advisory Council on Commercial Fishing
ACFC	Advisory Council on Fisheries Conservation
ACRF	Advisory Council on Recreational Fishing
ADT	Administrative Decisions Tribunal
AFMA	Australian Fisheries Management Authority
AQIS	Australian Quarantine and Inspection Service
CAMBA	Agreement between Australia and the People's Republic of China for protection of Migratory Birds and their Environment
COE	Certificate of Exemption
CPUE	Catch Per Unit Effort
DLWC	Department of Land and Water Conservation
DUAP	Department of Urban Affairs and Planning (now Planning NSW)
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMPMP	Emergency Marine Pest Management Program
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
ESD	Ecologically Sustainable Development
FM Act	Fisheries Management Act 1994
FMS	Fishery Management Strategy
FP Act	Food Production (Safety) Act 1998
FRCAC	Fisheries Resource Conservation and Assessment Council
FRAC	Fisheries Research Advisory Committee
FRDC	Fisheries Research and Development Corporation
IMCRA	Interim Marine and Coastal Regionalisation for Australia
JAMBA	Japan-Australia Agreement for the Protection of Migratory Birds, Birds in Danger of Extinction and their Environment
MAC	Management Advisory Committee
MPA	Marine Parks Authority
NCC	Nature Conservation Council
NPWS	National Parks and Wildlife Service
NRSMPA	National Representative System of Marine Protected Areas
NSW	New South Wales
NSWF	New South Wales Fisheries
OH	Ocean Hauling
Regulation	Fisheries Management (General) Regulation 1995
RFA	Recreational Fishing Area
RFO	Recognised Fishing Operation
RFG	Recognised Fishing Ground
RFR	Registered Fish Receiver
RRFR	Restricted Registered Fish Receiver
SPF	Small Pelagic Fishery (formerly known as the Commonwealth Jack Mackerel Fishery)
TAC	Total Allowable Catch
TCM	Total Catchment Management
TSC Act	Threatened Species Conservation Act 1995

CHAPTER A. EXECUTIVE SUMMARY

Introduction

In December 2000, the NSW Government made changes to the way fisheries are managed in NSW. These changes place increased emphasis on ensuring that fishing activities are environmentally sustainable.

The changes require the development of fishery management strategies for each major commercial fishery, the recreational fishery, the recreational charter boat fishery, fish stocking programs and for the beach safety (shark) meshing program. They also require an assessment of the environmental impacts of those fisheries.

The management strategy and environmental impact assessment for each fishery are joined together in a document termed the Environmental Impact Statement (EIS) for the fishery. Its structure is based on guidelines issued by Planning NSW.

This overview constitutes the first chapter (Chapter A) in the EIS. Chapters B, C and D present an analysis of the current management rules operating in the fishery, a description of the proposed management arrangements for the fishery for at least the next five years (the draft strategy), and an outline of the alternative management approaches considered respectively. Together these chapters (Chapters A to D) comprise Volume 1 of the EIS.

Volume 2 comprises Chapters E to J, which contain an assessment of the biophysical, economic and social impacts of the management rules proposed for the fishery, and a justification for the chosen strategy.

Volumes 3 and 4 are appendices to the two main volumes.

This overview provides an introduction to the environmental assessment process. It briefly outlines the context within which the fishery operates, the management rules contained in the draft strategy, and the findings of the environmental impact assessment for the Ocean Hauling Fishery.

The public release of the EIS provides an opportunity for the community as a whole to review the environmental performance of the Ocean Hauling Fishery, and to have input into its future management.

The Development of Fishery Management Strategies

The draft strategy (Chapter C) for the Ocean Hauling Fishery contains all the proposed rules for management of the fishery, but it is much more than a collection of rules. The draft strategy contains the objectives for the fishery, a detailed description of the way the fishery operates, and describes the management framework for at least the next five years. It also outlines a program for monitoring the environmental, social and economic performance of the fishery, establishes trigger points for the review of the strategy, and requires annual reporting on performance in order to ensure that the strategy meets its objectives.

The Management Advisory Committee (MAC) for the Ocean Hauling Fishery provided significant input into drafting the strategy. The MAC, which includes the elected representatives of the ocean hauling fishers as well as representatives of recreational fishers and the Nature Conservation Council, has a similar role to that of a proponent preparing a land-based development application.

Input into the draft strategy was also sought from all fishers in the Ocean Hauling Fishery, the Minister for Fisheries' advisory councils on conservation, recreational fishing, commercial fishing (which includes commercial fishers from other fisheries) and the Fisheries Resource Conservation and Assessment Council. Government agencies, such as Planning NSW and the Commonwealth's Environment Australia, have also been consulted during the drafting of the EIS, as have professionals in the fields of aquatic research and environmental impact assessment.

The Environmental Assessment Process

The EIS incorporates an assessment of the likely environmental impacts if the draft strategy was to be implemented.

It is important to understand that the environmental impact assessment and the strategy have been developed concurrently, in a series of steps. The draft strategy assessed here is in fact the third draft of the strategy. The process has been designed to give early feedback to the MAC and allow the industry to respond to the predicted environmental impacts of their management proposals. Each draft of the strategy is then modified to ensure that the proposed management framework appropriately addresses the environmental impacts identified during the assessment process.

This is the second time in NSW that the widely accepted environmental impact assessment process has been applied to fisheries assessments. The previous occasion was the assessment of the Estuary General Fishery.

While the principles are the same, there are distinct differences between assessing the impacts of an existing fishing industry and assessing, for example, a new building development. One difference is that the fishing industry being assessed already exists and, consequently, any changes to fishing practices and levels of harvest will have direct social and economic impacts on these already-established fishing and related industries. It is important that the impacts of proposed changes are carefully assessed and therefore, where appropriate, time is allowed to adjust to any changes required.

The assessment of fishery impacts is also much more difficult than is the case with many other natural resources because, in comparison to our knowledge of terrestrial resources, much less is known about aquatic ecosystems.

In reality, and with few exceptions, the population sizes or biomass of fish species are unknown. Fisheries science has to rely on relative measures to estimate changes in population sizes over time. These estimates are made using information from recorded catches, from fishing effort reported by commercial fishers and from extrapolations of surveys of recreational catches, and therefore have considerable uncertainty attached to them. Even when changes to fish abundance are detected, the precise reasons for the changes are often not known.

The recent national survey of recreational and Indigenous angling catches in Australia is expected to provide much better estimates (when combined with estimates of commercial catches) of total catches than has previously been possible. The best of these estimates will be for species that are both commercially and recreationally important. There will remain, however, considerable uncertainty in most harvest estimates.

The precautionary principle, a key component of the principles of ecologically sustainable development, provides guidance for dealing with uncertainty. This principle says that if there are threats of serious or irreversible damage to fish stocks, lack of full scientific certainty should not be used as a reason for postponing measures to prevent that damage.

Similar uncertainty exists over the impacts of fishing methods on the environment, and there are strong and varying opinions from all sectors.

The EIS acknowledges these uncertainties but uses the best available information to document the likely impacts of the fishery:

- on fish resources
- on the environment (including biodiversity and threatened species)
- on the economic and social status of existing ocean hauling fishers.

As well as satisfying the environmental assessment requirements of the NSW *Environmental Planning and Assessment Act 1979*, the EIS will also be submitted to the Commonwealth Government to meet assessments required by the *Environment Protection and Biodiversity Conservation Act 1999*.

NSW Coastal Waters and Ocean Beaches

The eastern Australian coastline is comprised of long barrier type beaches interrupted by rocky headlands and estuaries. The beaches along the coast are formed from marine sands and are dynamic in their structure. Prevailing winds, currents, and climatic events are constantly sculpturing their profile. The structure of ocean beaches can include extensive sand flats, deep gutters and offshore sand bars.

Ocean hauling is undertaken both on ocean beaches and from boats in ocean waters out to three nautical miles. There are a wide range of competing activities taking place both on ocean beaches and in near shore ocean waters. These areas include commercial fishing in the Ocean Trap and Line, Ocean Fish Trawl and Ocean Prawn Trawl fisheries. Other important activities include recreational fishing, Indigenous fishing, and non-harvesting activities such as swimming, diving, recreational boating, and use of beaches.

The Ocean Hauling Fishery

Beach hauling, commonly known worldwide as seine netting, was one of the first methods of fishing carried out along ocean beaches by European settlers in Australia. The NSW Ocean Hauling Fishery includes the taking of fish in ocean waters by various hauling net and purse seine net methods deployed from ocean beaches and from sea-going boats.

Under a quarter (374) of the State's commercial fishing businesses are entitled to operate in the Ocean Hauling Fishery using hauling nets and/or purse seine nets to target fish in NSW coastal waters. The Ocean Hauling Fishery targets only a few main species, such as sea mullet, sea garfish, luderick, yellowtail, blue mackerel and pilchards, although, up to 74 species have been included on recorded landings in recent years. In 1998/99 and 1999/00 the estimated average annual value of the fish harvested was approximately $5.2 m at first point of sale.[1]

The most commonly used net in the fishery is the general purpose hauling net deployed from ocean beaches, and primarily targets travelling sea mullet as they move north along the coast to spawn. The remaining net types in the fishery include purse seine nets, garfish hauling nets, garfish bullringing nets and pilchard, anchovy and bait nets.

[1] Based on Sydney Fish Market average monthly prices, and does not account for higher prices paid for exports or in other markets.

NSW Fisheries has records of reported commercial fishing catches covering the last 50 years. The overall amount of fish reported as taken by ocean hauling remained relatively stable until the mid-1980s, when the expansion of the catches in the fishery may be attributed to two unrelated factors. One of these was the development of a market for mullet roe (eggs) and the consequent expansion of effort in ocean hauling activities targeting the pre-spawning mullet run. The other factor was the increased marketing of catches from the purse seine fishery for human consumption, specifically targeting blue mackerel and yellowtail. When addressing trends in catch and effort, consideration must also be given to allow for increases in effort associated with improved technology, including the introduction of outboard motors, modern refrigeration techniques, motorised net haulers, and synthetic net material.

Commercial fishing was first regulated under the *Fisheries Management Act 1865*. By the end of the 19th century there were regulations restricting the type, size and use of fishing nets, fishing closures, and licensing of fishers and boats. These types of controls are still in existence today, but many other management arrangements now also apply to the Ocean Hauling Fishery.

Sharing the catch

Commercial ocean hauling fishers commonly operate alongside, and at times in competition with other commercial fishers, recreational anglers, Indigenous fishers, charter fishing operators, recreational divers, beach goers, and a variety of other users of our coastal waters. There has been a tendency in the past for each harvesting sector to blame the actions of others for perceived declines in fish stocks. However, today there is a statutory requirement to appropriately share the resource.

Some members of the community dislike net fishing on beaches and are quick to draw conclusions about the sustainability of such practices, particularly bycatch associated with hauling methods. Some commercial fishers on the other hand point out that hauling and purse seine fishing practices in this fishery are highly targeted, and do little or no damage to associated habitats. Determining whether or not these practices are sustainable and environmentally friendly is a major aim of the environmental assessment.

There are a number of other initiatives currently under way that may affect existing allocation arrangements, namely the recreational fishing area process, the establishment of marine protected areas, and the development of an Indigenous Fisheries Strategy.

- *Recreational fishing areas.* A general recreational fishing fee was introduced in March 2001. Money raised by the fee is being used to improve the quality of recreational fishing. A major initiative funded by this fee has been the creation, after extensive community consultation, of areas protected from commercial fishing. These recreational fishing havens aim to resolve long standing resource-sharing issues in areas popular with large groups of anglers, and can involve closing small or large areas to commercial fishing, or changing or stopping a commercial fishing practice (for example a particular fishing method) within a specific area. Under this process, sufficient commercial fishing businesses will be bought out to ensure there is no net transfer of commercial fishing effort into other areas, and fair compensation will be offered to the owners of fishing businesses that are acquired. At the time of writing, twenty-nine new areas to be protected from commercial fishing have been announced, including two (Botany Bay and Womboyn Beach) which directly relate to the Ocean Hauling Fishery. For a complete list of the new recreational fishing havens that have been announced, refer to the NSW Fisheries website: http://www.fisheries.nsw.gov.au.

- *Marine protected areas.* NSW is committed, under national and international agreements, to the conservation of marine biodiversity and to the ecologically sustainable use of marine resources. Nationally, all states and territories are working towards establishing a national representative system of marine protected areas. In NSW, the term 'marine protected areas' includes large multiple-use marine parks, small aquatic reserves, and the marine components of some national parks and nature reserves.

  Together with sustainable fisheries management and coastal protection, marine protected areas play a vital role in conserving marine ecosystems and in maintaining natural processes. At the time of writing, three marine parks had been created and consultation was occurring over the possible creation of additional marine protected areas.

- *Indigenous Fishing.* Changes to fisheries management policies, practices and laws have increasingly impacted on Indigenous fishing activities over the years. Commercial and recreational uses of fisheries resources can cause concerns for Aboriginal communities as these practices may interfere with cultural activities. Many Aboriginal people have also expressed an interest in expanding their involvement in the commercial use of fisheries resources, thereby contributing to their financial independence. Indigenous communities also want to participate more in the management of the resource. In response to these concerns, the Government is preparing a NSW Indigenous Fisheries Strategy in consultation with Aboriginal people and fisheries stakeholder groups.

  An Indigenous Fisheries Strategy would consider issues such as the subsistence fishing and ceremonial needs of Aboriginal peoples, and Aboriginal involvement in the commercial use of fisheries resources, including aquaculture. Aboriginal people agree that resource sustainability remains paramount and any strategy must take into account the impacts of such practices on biodiversity.

The (draft) Fishery Management Strategy

Input and output controls are the two broad types of management tools that can be used to manage fisheries.

Input controls limit the amount of effort that can be applied to take fish in the fishery, thereby indirectly controlling the catch. Input controls can be as broad as limiting the number of people that can fish, or as specific as prescribing the length and mesh size of a net and the times and places it can be used.

Output controls directly limit the amount and sizes of fish that can be harvested (usually of a particular species). Output control regimes can vary from setting a total allowable catch for an entire fish stock with individually allocated and tradeable quotas, to setting a maximum daily limit on catches (trip limits) or prohibiting the taking of a particular species all together.

The Ocean Hauling Fishery has historically been managed through a series of input and output controls. Input controls used have included limits on the number of commercial fishers, limits on the size and type of gear used, and fishing closures in some areas or at certain times. Output controls, in particular minimum legal lengths for many of the target species, have applied for many years. Some fish such as blue groper and the great white shark have been completely protected from commercial fishing.

This mix of input and output controls have provided a fair level of protection for fish stocks during the past 100 or so years that the fishery has been in operation. The environmental assessment

process has, however, revealed a number of areas that could be considered a high environmental risk if the fishery was to continue operating without any change. These include excess fishing effort associated with some methods and the risk of major effort shifts. The assessment also highlighted the lack of knowledge about: the size of fish stocks, the sustainability of current harvest levels, bycatch, threatened and protected species interactions and the impact of existing fishing practices on key fish habitats.

To address these and other issues, the draft strategy lists eight major long term goals for the management of the fishery:

1. to manage the Ocean Hauling Fishery in a manner that promotes the conservation of biological diversity in the ocean environment
2. to maintain fish populations harvested by the Ocean Hauling Fishery at sustainable levels
3. to promote the conservation of threatened species, populations and ecological communities associated with the operation of the Ocean Hauling Fishery
4. to appropriately share the fisheries resource and carry out fishing in a manner that minimises social impacts
5. to promote a viable commercial fishery (consistent with ecological sustainability)
6. to ensure cost-effective and efficient ocean hauling management and compliance programs
7. to improve public understanding of the fishery and of the resources upon which the fishery relies
8. to improve knowledge of the Ocean Hauling Fishery and the resources upon which the fishery relies.

These management goals are supported by 27 specific objectives and more than 90 management responses including immediate actions, development of future management and enforcement measures, and scientific research and monitoring programs.

The major changes to management of the fishery proposed in the draft strategy are:

- stock assessments and biologically-based reference points for monitoring stock status will be established for all ocean hauling target species within five years of commencement of the strategy
- detailed monitoring of the landed catch, including length and age of target species, and species composition
- development of specific management arrangements for sea garfish, a species which is currently believed to be overfished, within six months of approval of the strategy
- the use of species-based closures as the preferred means of implementing short-term (up to several years) constraints on active fishing effort as required.
- the issue of 15 year tradeable shares to ocean hauling fishers in accordance with the category two share management fishery provisions of the *Fisheries Management Act* 1994
- the control of the long-term application of fishing effort through minimum shareholdings for each method

- design and implement, once the strategy is approved, an observer-based study that will assist in estimating the impact of ocean hauling fishing methods on fish habitats, threatened species and document the rate and species composition of bycatch
- manage the difference in efficiency (for the same gear type) of beach-based and boat-based fishing by developing an index of fishing power for each method
- adaptively modify fishing practices to reduce the impacts of the fishery on all non-target species, habitats or communities
- limiting the species taken by each net type for each of the Ocean Hauling Fishery
- prevent directed fishing for non-target species by limiting landings of those species
- developing, maintaining and improving an enforceable code of conduct for all sectors of the Ocean Hauling Fishery
- prohibit the use of the general purpose hauling net over the strapweed seagrass (*Posidonia australis*)
- completing by July 2004, the regional liaison process that has allowed locally negotiated outcomes in relation to beach access and local amendments to the code of conduct
- improving the publicly available information about the Ocean Hauling Fishery and promoting understanding in the community about the activities of the fishery by:
    - publishing the strategy, prosecution reports and annual strategy performance reports
    - producing or contributing to the production of brochures, newsletters, signs and undertake targeted advisory and educational programs, as required
    - monitoring catch levels and management arrangements in fisheries beyond NSW jurisdiction, where catches in those fisheries impact on stocks shared with the Ocean Hauling Fishery
- improving the systems used to record landings by the Ocean Hauling Fishery and ensure the accuracy of landings information by:
    - regularly reviewing the catch return forms and ensuring that they are filled in accurately and that they are designed to be easy to use
    - ensuring species names and identification are consistently applied throughout the fishery
- developing by 2004, a policy to manage the harvest of bait from NSW waters that is used in the Commonwealth Tuna Fishery. Items to be considered in the development of this policy will include any code of conduct or observer programs for the relevant methods.

In addition to these proposed changes, the draft strategy incorporates a comprehensive performance monitoring system that will measure whether the stated management goals are being attained. The draft strategy identifies a series of indicators of management performance, and contains reference points that will trigger a review of the management rules if the fishery or fish stocks change beyond acceptable limits. All reviews of the management rules will be made public and completed within set timeframes.

Assessment of the Environmental Impacts

The assessment of the environmental impacts of the fishing activity proposed and risk mitigation measures contained in the draft strategy are summarised in the text that follows and in Table A1.

Impact on the fish resources

The draft strategy contains a series of measures that address harvest sustainability issues for target species in the Ocean Hauling Fishery and minimise any adverse impacts of the fishery on the surrounding environment. Specifically, the measures aim to develop stock assessments for the 16 target species, to reduce the risk of overfishing, to control fishing effort and improve our knowledge regarding bycatch and the interaction between the fishery and surrounding habitats.

The fishing activity proposed by the draft strategy is managed by a combination of fishing gear and effort controls, and area-based restrictions. The draft strategy does not treat each species in isolation, nor does it treat each species from the point of view of the Ocean Hauling Fishery alone. Rather, it is based on a holistic assessment that also takes into account interactions between target species, the impacts of fishing methods on habitats, and the cumulative effects of other fisheries or fishing sectors (including recreational fisheries) on targeted stocks.

It should be recognised that for most of the species taken in the Ocean Hauling Fishery, current knowledge of stock status is poor or non-existent. Whilst reasonable information is available for some of the more important target species, little is known about the status of the stocks for the majority of retained species within the Ocean Hauling Fishery. Five species (yellowfin bream, sea mullet, sand whiting, yellowtail and silver trevally) have undergone stock assessments using fishery dependent indices of abundance, and ancillary information such as age structures, but the data has not yet been incorporated into a formal model. The stock assessments for a further three species (eastern sea garfish, luderick and blue mackerel) are still under development, or have been completed only at an elementary level. The stocks of the remaining eight species (Australian salmon, pilchard, sweep, sprat, dart, jack mackerel, anchovy and bonito) have not been assessed.

For those eight species for which some level of stock assessment has been completed, two (luderick and sand whiting) are considered to be moderately fished by the Ocean Hauling Fishery, four to be fully fished (blue mackerel, sea mullet, yellowfin bream and yellowtail), and two to be overfished (eastern sea garfish and silver trevally). Significant measures are proposed in the draft strategy to address the overfishing of eastern sea garfish within the fishery. Silver trevally are primarily caught in the Ocean Fish Trawl Fishery and stock recovery proposals will be included within the management strategy for that fishery, with contributions from members of the Ocean Hauling Fishery and other fisheries. Of the remaining species, sharply declining catch rates for sweep and pilchards were of concern and are addressed by specific measures in the draft strategy, including trigger levels based on landings in the short term and stock assessments in the longer term.

The draft strategy has been assessed to adequately address one of the most significant knowledge gaps within the fishery, namely bycatch (which anecdotal information suggests is low) through the development of an observer program. These programs will assist in quantifying the level of non-retained catch, and will also provide some information about the interaction between fishery methods and the associated habitat. Given the paucity of data that exists in relation to bycatch within the Ocean Hauling Fishery, it is considered that these initiatives are acceptable and will enhance the future management options for the fishery.

Targeting aggregations of fish is standard practice in many fisheries around the world, as it allows for the efficient harvest of large volumes of fish. Such aggregations are often associated with spawning. This has led to overfishing in some fisheries, such as the Californian and Sumatran mackerel fisheries and the eastern gemfish fishery. The issue of targeting of spawning aggregations is often raised by members of the public who associate the practice with overfishing. However, biologically the timing of capture relative to the spawning period is much less important than the proportion of the stock taken. This is particularly true of long-lived species such as bream and luderick. The fact that these species remain popular target species despite being subject to these sorts of practices for 100 years suggests that these practices are probably sustainable. Recent declines of some species in the fishery are of concern however, the draft strategy proposes stock assessments, performance monitoring, species closures and net restrictions (ensuring the general purpose haul net is not used in offshore waters) in order to prevent the overfishing of species during spawning migrations along the coast.

Based on the available data, the assessment of the draft strategy suggests the proposed harvest strategies will increase the likelihood of long-term stock sustainability. Where uncertainty is highest, the draft strategy takes a conservative (precautionary) approach to future harvesting arrangements and places increased emphasis on performance measures, monitoring and research programs.

Impact on the environment

It is clear from the assessment that there is some information available about the biodiversity and habitats of ocean beaches and nearshore waters within which the fishery operates, however, nothing is known of the magnitude, extent, or even type of impacts that may occur as a result of fishing activities. The draft strategy does not propose any research programs to examine the effects of fishing methods on habitats and/or biodiversity, and such research is considered to be a low priority within the draft strategy. Until such programs are developed and implemented, there will be a high degree of uncertainty associated with any assessment of impacts on the biodiversity and habitats of the coastal environment in which the fishery operates.

In the absence of reliable data about the effects of the fishery on habitats and biodiversity of ocean beaches, rocky shores and inshore waters of the NSW coast, a precautionary approach has been adopted.

The assessment compared the area, methods and timing of the fishery with the fauna and habitats that could be affected and found that there was little likelihood that the fishery would damage habitats, and that any effects were likely to be associated with beach-based hauling methods, as they are the only methods that come into contact with the substratum. Nor did there appear to be any significant effects on fauna beyond those species targeted in the fishery.

These findings were based on extrapolations from studies of much larger, more intensive equipment, often from overseas and in offshore environments. Qualitative comparisons suggest that the gear used in the Ocean Hauling Fishery is less damaging. The few studies of similar fishing gears and habitats were either inconclusive or not readily correlated.

The assessment also found it probable that any impacts due to past activities of the fishery were neither long term nor permanent. There is, however, an obvious need for the collection of targeted, quantitative data and for it to be fed back into the strategy during subsequent reviews.

Consistent with the measures proposed in the draft strategy for the Estuary General Fishery, the draft strategy for the Ocean Hauling Fishery proposes to ban the use of general purpose haul nets

through beds of strapweed (*Posidonia australis*), removing the potential for the fishery to negatively impact seagrass habitats and their fauna. The draft strategy also proposes to more than treble the area of beaches (including their nearshore waters) permanently closed to the fishery from the current 4.5% to approximately 17%. In addition to the other seasonal or temporal closures that exist within the fishery, such measures would minimise the total area susceptible to any potential impacts.

The Ocean Hauling Fishery has the potential to affect approximately 43 species listed as threatened under either the *Fisheries Management Act 1994*, *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*. At this stage, however, there appears to be little or no data implicating the fishery in having any adverse impact on any of these species or their habitats. Nor is there any evidence of the fishery accentuating other circumstances that may be having an adverse impact upon them. In the absence of data to the contrary, the fishery in its existing form is thought to be having minimal impact on threatened species. The draft strategy contains measures, however, that should be effective in identifying any impacts and minimising them where they do occur. Observer programs will be required to obtain information about effects due to disturbance, not just direct capture, as this appears to be the most likely form of impact on the majority of threatened species and species of international significance.

If the recovery plans developed over time by the threatened species units of NPWS and NSW Fisheries are effective and numbers of listed threatened species increase, there will be an increased likelihood of occurrence and interaction with the activities of this fishery. It will be important, therefore, to schedule observer surveys every few years to assess whether threatened species interactions remain relatively low.

The EIS has considered the eight factors under section 5A of the *Environmental Planning & Assessment Act 1979* in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats. The assessment was based on a review of biological information derived from the various agencies responsible for those species, from published literature and from personal communications. There were no data available detailing any effects of the fishery on any threatened species. The assessment concluded that the Ocean Hauling Fishery will not have a significant effect on any threatened species, populations or ecological communities or their habitats and, as such, a species impact statement was not required.

There is a great deal of uncertainty in relation to trophic impacts associated with fishing, and most of the studies which have attempted to examine these impacts have been done in vastly different environments and on different methods and species to those taken in the Ocean Hauling Fishery. In the absence of quantitative data about the bycatch associated with the fishery, although anecdotal information suggests it is insignificant, there is some risk that the fishery could affect the trophic structure of sandy beaches or rocky reef ecosystems. Consideration of the methods used in the fishery and the fact that fishers target schooling species, however, suggest that there is likely to be minimal habitat damage, little or no discards, and thus limited potential for alteration of the trophic structure of beach or reef ecosystems. The draft strategy proposes numerous measures to try and understand more about both discards and potential trophic effects, but overall are unlikely to significantly aid our limited understanding of trophic interactions of sandy beaches or inshore waters. Such studies would necessarily be far more complex, extensive and expensive than the draft strategy is likely to be able to accommodate.

The methods in the Ocean Hauling Fishery and the limited movement of fishers between management zones limit the risk of transferring marine pests from one area of the coast to another.

Similarly, there is a low risk that fishing operations will facilitate the spread of disease through the movement of equipment between areas.

There are currently no proposals for the artificial enhancement of populations of fish or invertebrate species targeted in this fishery. Any such proposals would be subject to the provisions of the *Environmental Planning and Assessment Act 1979*.

There is no information available on the levels of stress, injury or susceptibility to disease that might be imposed as a consequence of the activities of the fishery. The fishing methods target particular species of fish in a high-energy environment, severely restricting the potential for discards and thus the potential for the release of stressed or diseased fish.

Pollution generated by the fishery is likely to be relatively low and any pollution events to be of low to moderate frequency. The number of vessels used in the fishery represent less than 0.5% of the more than 180,000 vessels registered by the Waterways Authority in NSW. The collective potential for pollution from these vessels is likely to be only a small fraction of that associated with boating generally. As fishing activities are carried out, moreover, out in the high-energy environment of coastal beaches and nearshore waters, which are an open system and have a high assimilatory capacity, any potential risk to water quality is likely to be low. Given the existing controls administered by the Waterways Authority and the Environment Protection Authority vessels in the fishery do not require any further management. The fishery is considered to have minimal potential for significant adverse impacts due to light, noise, vehicle or boat emissions. Existing and proposed controls to limit the time and area fished, and the code of conduct should mitigate any potential impacts and monitoring of the level of complaints and the observer study will allow collection of data on their occurrence for use in future assessments.

There are some external factors that have the potential to significantly affect the operational area, capacity and species of the Ocean Hauling Fishery. Most relate to conflict resolution or resource allocation, and are managed within the draft strategy through management responses and regionally negotiated outcomes. Some of the most important factors affecting the fishery are weather and the establishment of marine parks, but these are beyond the control of the draft strategy.

Weather and oceanographic conditions are responsible for determining the distribution and abundance of the species targeted by the fishery, and have a pronounced effect on the fishery. Marine parks have the potential to significantly reduce the area and methods of the fishery, and with marine parks already established at Solitary Islands and at Jervis Bay, and with commitments to the establishment of another three in NSW, marine parks could have long term effects on the operational capacity of the fishery. Any such effects will be mitigated, however, by the Government's commitment to buy out sufficient fishing businesses (when establishing marine parks) to ensure there is no transfer of fishing effort out of sanctuary and habitat protection zones.

Economic impacts

The review of existing information indicates that the Ocean Hauling Fishery is based predominantly north of Sydney, although some fishing occurs on the south coast. The fishery incorporates a diverse range of businesses with endorsements in several managed fisheries. The Ocean Hauling Fishery is seasonal, with a high period in April to July; it comprises predominantly one person businesses that form teams or partnerships between fishers, and has limited corporate involvement. Teams are at the core of the beach fishery, but there is little information on these.

An assessment of trends in licence values show no significant rise in ocean hauling endorsement values in the last eight years, but this is a limited measure of economic performance due to restrictions on transfers of endorsements. The fishery is highly variable in capital investment levels, with some fishers having small boats, while others have significant investment in the fishery, hauling nets being a major expenditure item.

Economic surplus exists in 25% of all businesses examined, with businesses obtaining more than 20% of revenue from ocean hauling fishing being more profitable than diversified businesses surveyed. The businesses currently operating below long term viability levels are effectively subsidised by forgoing returns on capital and labour, presumably to accommodate lifestyle. For these operators, increased management charges and requirements to purchase shares will impact on their operational viability.

The assessment of management responses contained in the draft strategy are ranked on the basis of their potential larger scale economic impacts. The following issues are assessed:

- under the strategy an annual 3% reduction in the number of fishing businesses can be expected, consistent with the rate experienced under current licensing policies, thus reducing effort over time. The assessment predicts that the number of fishing businesses will reduce from 374 fishing businesses in 2001, to 319 in 2006. Some businesses will exit, the most likely being those that fish infrequently (latent effort) and/or those businesses grossing below $10,000 per year. Shares will be more readily purchased by the 25% of businesses in economic surplus. It is essential to monitor latent effort and contain active effort levels within historical guidelines, as stated in the draft strategy. The economic flow-ons from exiting businesses will be low due to their low catch history
- the draft strategy addresses any reduction in species availability using short term effort controls such as closures that reflect the seasonal nature of the fishery. A minimum shareholding provision will be implemented for garfish net (hauling) endorsements. Of the 82 garfish net haulers, mostly found in Regions 4 and 6, it is estimated that 12 fishers would sell their garfish shares and that this will result in a reduction in effort
- management responses within the draft strategy that are likely to have medium level impacts include: team based minimum shareholdings, category 2 share management, including upper limits on shareholdings in a region, improved marketing through fish penning and a new cost recovery framework
- management responses within the draft strategy that are likely to have low impacts include: changes in icing and food safety practices, allocation and effort containment issues, as well as some gear regulations.

Social impacts

Existing social data on fishers and their communities was supplemented by obtaining access to Australian Bureau of Statistics (ABS) data and through a telephone questionnaire of 222 ocean hauling fishers. The regional and community location of fishers was identified from licensing data and compared with the ABS data for a range of social indices, including the Socio-Economic Index for Areas (SEIFA) index of disadvantage for rural communities, at the postcode level.

Total employment in businesses with an ocean hauling endorsement, is estimated as between 615 and 975 persons (full time and part time), though those directly associated with the Ocean Hauling

Fishery would be less. A social profile of ocean hauling fishers revealed fishers to be an aged, highly resident population, with substantial fishing experience and strong family involvement with fishing. Fishers in excess of 60 years of age comprise 21% of all ocean hauling fishers.

Approximately 71% of interviewed fishers were insistent about their identity as fishers and were unable, or unwilling, to consider re-training. This "psychic income" from fishing and problems in mobility of fishers are analogous to the NSW dairy industry. The past management of the Ocean Hauling Fishery has included regional negotiations to ensure that the views of local people and community representatives were considered in the use and management of hauling on ocean beaches.

The issues thought to pose the highest impact on the socio-economic status of communities were the use of minimum business shareholdings, species closures and minimum shareholdings to assist garfish to recover. Each of these changes has the capacity to impact fishers, families and local communities.

The major social changes in the draft strategy involve the displacement of between 60 and 70 fishers within five years, through the implementation of minimum business shareholdings and garfish minimum shareholdings. These changes will probably impact on part time and older fishers, and/or fishing businesses grossing less than $10,000 per year.

On implementation of the draft strategy, the ocean hauling fishing communities in Far South Coast, Illawarra, Manning, Clarence, and Wallis Lake areas are most vulnerable to changes from the socio-economic impacts under the plan. An estimated 60-70 fishers, with between 23-91 dependents, will be impacted to differing extents in proportion to their age and dependence on income from the Ocean Hauling Fishery.

The social impact will be noticeable in ocean hauling fishing communities, given the lack of alternative employment for many aged fishers, but also enabling elderly fishers to retire with a payment from the sale of shares. Further research should prioritise understanding of fishing communities, to reduce the cumulative impacts from successive management strategies.

Health impacts

The Seafood Safety Scheme Regulation is based on the premise that some species and/or activities represent a potentially higher food safety risk than others. An example of a high-risk group is bivalve molluscs, which are caught in the Estuary General Fishery but not in the Ocean Hauling Fishery.

The species retained in this fishery are considered to be a low food safety risk and thus do not require any special management arrangements.

Heritage impacts

The activities associated with commercial fishing are limited to associated boating, foreshore access and the use of a variety of nets. The physical and spatial presence of heritage resources along ocean beaches is likely to have only a marginal interaction with commercial fishing operations. With regard to shipwrecks, it appears likely that commercial fishing will have no impact on residual material evidence, having regard to the likely nature, bulk and mass of any residual material and the potential for sub-surface material to be covered by silt/sand. It is considered that there is a low risk that activities in the Ocean Hauling Fishery will impact on European heritage sites.

There is abundant ethnographic and archaeological evidence for past use of beaches, headlands and nearshore waters by Aboriginal people, and of the importance of resources from these environments to Aboriginal economies and lifestyles. Aboriginal sites along the sandy coastline are potentially at some risk of impacts by beach-based fishers, principally because of access to these areas by four-wheel drive vehicles. It should be noted, however, that beach haulers comprise only a small proportion of the four wheel drive users of those ocean beaches that were traditional fishing and shellfishing locations for Aboriginal people. Natural processes such as storm wave erosion of frontal dunes and the mobility of transgressive dune fields also threaten beach midden sites in many areas. Significant destruction of coastal dune sites also occurred during several decades of beach and dune mining for heavy mineral sands.

In general, the physical evidence of past Aboriginal occupation along beaches is most severely threatened by land uses and activities other than those associated with this fishery. The overall risk that activities proposed in the draft strategy would detrimentally impact on Aboriginal cultural heritage evidence along NSW beach and dune systems is considered to be small.

Indigenous issues

There are several concurrent policy development initiatives by NSW Fisheries that will affect the interaction of Aboriginal fishers with the Ocean Hauling Fishery. In particular, NSW Fisheries is currently working with the Aboriginal community to develop an Indigenous Fisheries Strategy that will provide a new framework for working with Indigenous people engaged in fishing.

Since the mid-1980s, a number of new regulations have been introduced to more effectively control fishing effort and impact. The number of Aboriginal people who are licensed as commercial fishers in the Ocean Hauling Fishery and the relative scale of their fishing effort is unknown. The introduction of greater regulations has had several unintended consequences in relation to the access of Aboriginal communities to the ocean beach fishery. The impacts of the regulations continue to be of concern to Aboriginal fishers. Existing legislation does not currently recognise Indigenous fishers as a separate sector of the fishing population, and this has been a large part of the reason for the impacts of policies on the Aboriginal community not previously being predicted. The draft strategy does not specifically address the Aboriginal community's view that the evolution of the fisheries legislation in NSW has gradually but consistently undervalued the interests of Aboriginal people in the Ocean Hauling Fishery. The draft strategy does, however, provide for changes in the fishery resulting from the development of the Indigenous Fisheries Strategy to better accommodate Aboriginal community interests.

Many of the concerns of Aboriginal communities about the impact of current commercial fishery regulations on their livelihoods and lifestyles are being addressed in partnership with NSW Fisheries to develop the Indigenous Fisheries Strategy. This process may take some time, however, both to finalise to the satisfaction of all stakeholders, and to implement if changes to other strategies and legislation are required. Ongoing review of the draft fishery management strategy will be essential to ensure that any changes in the policy approach to Indigenous fisheries are incorporated.

Justification for the Draft Strategy

The EIS highlighted the importance of the Ocean Hauling Fishery to the community in terms of employment, supply of seafood and economic benefits. There are more than 600 people employed in association with the fishery, many of whom would not readily find alternate employment. The fishery contributes more than two thousand tonnes of fresh seafood products for consumers in NSW

and beyond. Recent market surveys clearly indicate the increasing consumption of seafood product and demand for locally caught seafood.

Should the fishery not continue, much of the production and value realised by the fishery could not be produced by other means. Some of the benefits and productivity of the fish stocks would be taken up by other fisheries but most could not be replaced.

The EIS concluded that the management rules proposed by the draft strategy provide for an appropriate allocation of the resources used by the fishery, and contained sufficient measures to address the various principles of ecologically sustainable development, including the precautionary principle.

Consulting the Community

You are invited to comment on the Environmental Impact Statement on the Ocean Hauling Fishery, which is on public exhibition until 18 March 2002. The full EIS can be viewed at NSW Fisheries offices, the head office and regional offices of Planning NSW, NSW Government Information Service, local coastal councils (including relevant Sydney councils) and the Sydney office of the Environment Centre (NSW) during normal business hours. A paper or CD copy can be purchased for $25 (includes GST). It is also available on the NSW Fisheries website at www.fisheries.nsw.gov.au.

Need more information?

For enquiries relating to the Ocean Hauling Fishery, please phone (02) 9527 8556.

For enquiries relating to the environmental impact statement, please phone (02) 9527 8507.

Or visit: www.fisheries.nsw.gov.au

Want to comment?

Write to: Environmental Impact Statement Submission
Ocean Hauling Fishery
PO Box 21
CRONULLA NSW 2230

Fax: 02 9527 8576 (marked attention “Ocean Hauling EIS Submission”)

Email: oceanhaul.eis@fisheries.nsw.gov.au

If you wish your submission to remain confidential, it should be so marked.

Comments must be received by 18 March 2002.

Table A1. A summary of the key issues of the EIS, the programs proposed in the draft FMS and their ability to mitigate those impacts.

Environmental Impact Assessment Summary Table					
Issue	**Component**	**Impact / Hazard**	**Environmental Risk**	**Programs Proposed in the draft FMS for Mitigation**	**FMS Likely to Reduce Risk?**
Impact on the fish resources	Retained species	Potential for overfishing	Extreme for 1 species	Development of recovery program; stock assessment	Yes
			High for 12 species	Minimum shareholding for access to method; species-based closures; stock assessment of target species; and regionally negotiated closures	Yes
			Medium for 3 species	As above	Yes
	Bycatch	Direct capture	Low	Use observer survey to determine methods, locations and times of highest risk	Yes
		Contact without capture	Low for all methods	Not required	-
		Ghost fishing	Not applicable	-	-
	Bait	Potential for overfishing of bait stock	Low	Not required	-
		Introduction of disease	Low	Not required	-
Impact on the biophysical environment	Biodiversity	Change in ecosystem function or reduced diversity	Medium	Observer survey; bycatch reduction; code of conduct; regionally negotiated closures	Yes
	Habitat damage	Change in ecosystem function or reduced diversity	Medium	Definition of traditional hauling grounds for beach-based methods; three-fold increase in the area of closed beaches; code of conduct limiting beach access points and vehicle speed; increased protection of seagrass	Yes, but would be strengthened by research programs to examine the effects of the fishery on habitats
	Threatened and protected species	Capture and mortality; habitat damage	Low	Observer survey to determine relative risk to species or populations in conjunction with Threatened Species Units of NSW Fisheries and NPWS; changes to catch returns	Yes, but observer survey needs to be repeated every few years to make provision for increases in the number and distribution of species
	Trophic structure	Change in the abundance and distribution of organisms	Poorly understood, but thought to be moderate as fishery targets numerous species of baitfish	-	Unlikely, but such studies may be beyond the scope of the FMS

Table A1 (cont.).

Issue	Component	Impact / Hazard	Environmental Risk	Programs Proposed in the draft FMS for Mitigation	FMS Likely to Reduce Risk?
Impact on the biophysical environment (cont.)	Translocation of organisms	Spread of pest or disease organisms	Low	Implementing measures in accordance with Australian Emergency Marine Pest Management Plan	Yes
	Fish health and disease	Transmission of disease	Low	Adopting AQIS guidelines, when developed	Yes
	Water quality	Increase pollutant levels	Low	Not required	-
	Noise	Disturbance	Low	Regionally negotiated closures; code of conduct	Yes
	Light	Disturbance	Low	Regionally negotiated closures; code of conduct	Yes
	Air quality	Engine emissions	Low	Not required	-
	Energy	Petrol or diesel use	Low	Not required	-
	Greenhouse	Engine emissions	Low	Not required	-
	External factors	Decrease operational area, time or species of the fishery	Medium	Coordination with other Government agencies	Yes, to the extent that the FMS can influence other Government policies
Economic impacts of the draft FMS	Economic viability	Poor economic viability	Medium	Establish minimum shareholdings; develop appropriate business-level viability monitoring tools	Yes
Social impacts of the draft FMS	Employment and community values	Reduced harmony within local communities	Medium	Maintain zoning scheme; code of conduct; increased deterrents for breaches of the FMS; regionally negotiated access	Yes
		Regional impact from implementing garfish recovery program	Medium	Regional monitoring of landings by method to determine impact	Unknown
	Health and safety	Fishers' well being	Low	Not required	-
		Provision of high quality seafood	Low	Adopting Food Safety Program guidelines, when developed; code of conduct	Yes
	European heritage	Damage of sites	Low	Not required	-
	Indigenous heritage and issues	Damage to cultural sites, resource allocation	Low to medium	Appropriate policies developed in response to emerging issues	Yes

CHAPTER B. REVIEW OF THE EXISTING OPERATION OF THE FISHERY

The Ocean Hauling Fishery has been operating in NSW for over 100 years and is subject to a range of reasonably comprehensive management controls. This chapter describes the existing fishery and looks at the species taken, the gear used and the current management arrangements that apply. It then outlines the issues that arise from the existing operation of the fishery, which are the issues that need to be addressed by the Fishery Management Strategy (FMS).

Chapter C then specifies the changes to the operation of the fishery that are proposed by the FMS to deal with each of the issues, and outlines the proposed harvesting strategy to apply to the fishery over the next five or so years.

1. The Fish Stocks

a) Extent of the fishery

The Ocean Hauling Fishery involves the taking of fish for sale from NSW ocean waters using hauling nets shot from, and retrieved to, beaches or shot from and retrieved to licensed fishing boats and the use of purse seine nets on licensed fishing boats. The fishery does not, however, include the taking of abalone and rock lobster as they are subject to separate management plans and require separate fishing entitlements. Although not a prescribed method of the fishery, the use of a lift net by licensed commercial fishers to take bait for tuna operations is proposed to be included in the Ocean Hauling Fishery.

b) Species of the Ocean Hauling Fishery

Collectively, the Ocean Hauling Fishery takes a range of species. Each method has a different range of species that are commonly targeted. A summary of the most prominent species taken in the Ocean Hauling Fishery is presented in Appendix B1. The summary presents information on life cycle, habitat preference, catches by fishery and method, seasonal catch trends and average market values for each of these species. The following is a list of the species that constituted 99% of the landed weight taken in the fishery during 1998/99.

≥99%

FAMILY	SPECIES	COMMON NAME
ARRIPIDIDAE	*Arripis trutta*	Australian salmon
CARANGIDAE	*Trachurus novaezelandiae*	Yellowtail
CARANGIDAE	*Trachurus declivis*	Jack mackerel
CARANGIDAE	*Trachinotus spp.*	Dart
CARANGIDAE	*Pseudocaranx dentex*	Silver trevally
CLUPEIDAE	*Sardinops neopilchardus*	Pilchard
CLUPEIDAE	*Hyperlophus vittatus*	Sandy sprat
GIRELLIDAE	*Girella tricuspidata*	Luderick
HEMIRHAMPHIDAE	*Hyporhamphus australis*	Eastern sea garfish
MUGILIDAE	*Mugil cephalus*	Sea mullet
POMATOMIDAE	*Pomatomus saltatrix*	Tailor
SCIAENIDAE	*Argyrosomus japonicus*	Mulloway
SCOMBRIDAE	*Scomber australasicus*	Blue mackerel
SCOMBRIDAE	*Auxis thazard*	Leadenall
SCORPIDIDAE	*Scorpis lineolatus*	Sweep
SILLAGINIDAE	*Sillago ciliata*	Sand whiting
SPARIDAE	*Acanthopagrus australis*	Yellowfin bream

The following list of species constitutes the remaining 1% of landed weight taken in the fishery during 1998/99. The large diversity within this 1% of recorded landings may be in part due to incorrect species identification and misreporting.

≤1%

FAMILY	SPECIES	COMMON NAME
ATHERINIDAE	various	Hardyhead
BELONIDAE	various	Longtom
CARANGIDAE	*Seriola lalandi*	Yellowtail kingfish
CARANGIDAE	*Scomberoides lysan*	Queenfish
CARCHARHINIDAE	*Carcharhinus limbatus*	Black tip shark
CARCHARHINIDAE	*Carcharhinus tilstoni*	Black tip shark
CHEILODACTYLIDAE	*Cheilodactylus douglasi*	Rubberlip morwong
CLUPEIDAE	*Spratelloides robustus*	Glass fish
CLUPEIDAE	*Hyperlophus translucidus*	Glass fish
CORYPHAENIDAE	*Coryphaena hippurus*	Dolphinfish
DASYATIDIDAE/ UROLOPHIDAE	*Stingray/stingaree*	Stingray
ENGRAULIDIDAE	*Engraulis australis*	Anchovy
GERREIDAE	*Gerres subfasciatus*	Silver biddy
GIRELLIDE	*Geralla elevata*	Rock blackfish
HERMIRHAMPHIDAE	*Hyporhamphus regularis*	River garfish
KYPHOSIDAE	*Kyphosus sydneyanus*	Drummer
LOLIGINIDAE	*Sepioteuthis australis*	Southern calamari
LUTJANIDAE	*Lutjanus argentimaculatus*	Mangrove jack
MONACANTHIDAE	*Eubalichthys bucephalus*	Black reef leatherjacket
MONODACTYLIDAE	*Monodactylus argenteus*	Diamond fish
MUGILIDAE	*Mugil georgii*	Fantail mullet
MUGILIDAE	*Myxus elongatus*	Sand mullet
MUGILIDAE	*Upeneichthys lineatus*	Red mullet
ODACIDAE	*Haletta semifasciata*	Grass whiting
PLATYCEPHALIDAE	*Platycephalus arenarius*	Sand flathead
PLATYCEPHALIDAE	*Platycephalus fuscus*	Dusky flathead
PLATYCEPHALIDAE	various	Unspecified flathead
PLEURONECTIDAE/ BOTHIDAE	various	Unspecified flounder
PRIACANTHIDAE	*Priacanthus spp*	Red bullseye
RACHYCENTRIDAE	*Rachycentron canadus*	Cobia
RHINOBATIDAE	*Trygonorhina faciata*	Fiddler shark
SCATOPHAGIDAE	*Scatophagus multifasciatus*	Old maid
SCIAENIDAE	*Atractoscion aequidens*	Teraglin
SCOMBRIDAE	*Katsuwonus pelamis*	Skipjack tuna
SCOMBRIDAE	various	Bonito
SCOMBRIDAE	*Thunnus thynnus*	Northern bluefin tuna
SCOMBRIDAE	*Euthynnus affinis*	Mackerel tuna
SCOMBRIDAE	*Scomberomorus commerson*	Spanish mackerel
SCOMBRIDAE	*Scomberomorus munroi*	Spotted mackerel
SCOMBRIDAE	*Thunnus albacares*	Yellowfin tuna
SCOMBRIDAE?	various	Unspecified tuna
SCORPIDIDAE	*Atypichthys strigatus*	Mado
SIGANIDAE	*Siganus nebulosus*	Black trevally
SILLAGINIDAE	*Sillago maculata*	Trumpeter whiting
SILLAGINIDAE	*Sillago flindersi*	School whiting
SPARIDAE	*Rhabdosargus sarba*	Tarwhine
SPARIDAE	*Pagrus auratus*	Snapper
SPHYRAENIDAE	*Sphyraena novaehollandiae*	Snook
SPHYRAENIDAE	*Sphyraena obtusata*	Pike
SPYRNIDAE	*Sphyrna lewini*	Hammerhead shark
TERAPONTIDAE	*Pelates quadrilineatus*	Trumpeter
TRIKIAKIDAE	*Galeorhinus galeus*	School shark
various	various	Unspecified shark
various	various	Unspecified fish
various	various	Squid

c) Bycatch species (discards)

No estimates of bycatch for any method in the Ocean Hauling Fishery are available. Anecdotal evidence and reported landings suggest that the fishery tends to target at a single species and with little bycatch. Fishers observe schools prior to deploying nets and can determine catch composition with reasonable accuracy. Catches taken by beach hauling nets generally consist of mature adults. Various species of sharks and rays are occasionally taken in small quantities.

d) Bait species

Purse seine fishers retain baitfish from their own catches to use as burley. The main species used as burley are blue mackerel, yellowtail, and pilchards. Fish waste from other species is also occasionally used as burley. Sea mullet, taken by general purpose hauling nets can often be dried and used as bait in lobster traps, while mullet offal can be used as bait by recreational fishers. Commercial fishers deploying hauling nets, however, do not use bait.

2. Existing Operational Areas

a) Normal areas of operation

The waters in which ocean hauling may currently be undertaken include the following:

(a) ocean waters within 3 nautical miles (nm) of the natural coastline (as defined in Schedule 1 of the *Fisheries Management (General) Regulation 1995*)

(b) the waters of Jervis Bay

(c) the waters of Botany Bay east of a line drawn from Bare Island generally southeast to the northernmost extremity of Sutherland Point (This inclusion of part of Botany Bay in the Ocean Hauling Fishery will cease from May 2002)

(d) the waters of Coffs Harbour.

Ocean waters are defined under Schedule 1 of the Regulation as waters east of the natural coastline of NSW, which is defined by a line drawn along the high water mark of the sea. In general, where an estuary meets the coast, the natural coastline is defined as follows:

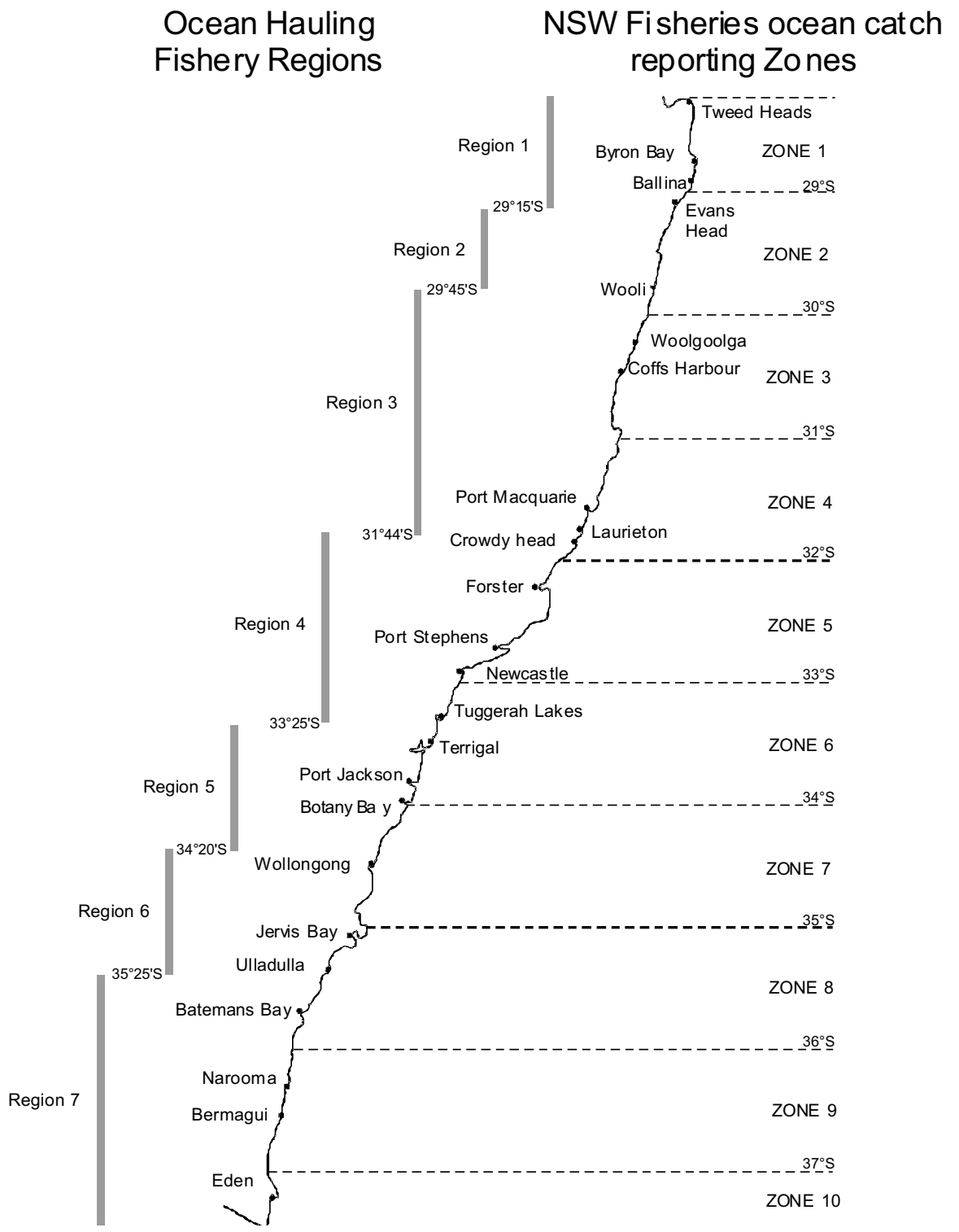
(a) a line drawn across the eastern most extremity of two breakwalls

(b) a line drawn from the eastern most extremity of the one breakwall to the northern or southern extremity of the high water mark on the opposite bank

(c) a line drawn across the entrance between the eastern most high water mark of the two banks.

Not all NSW ocean beaches and ocean waters are open to the Ocean Hauling Fishery. Appendix B2 contains those closures authorised under section 8 of the *Fisheries Management Act 1994* (the FM Act) that specifically restrict the area of ocean beaches (and/or ocean waters) where the fishery may operate (see section 5(b) of this chapter for further details on closures). Additional areas of ocean waters and sea beaches may be closed to ocean hauling operations through the declaration of marine protected areas, such as marine parks, aquatic reserves, intertidal protected areas and national park or reserve extension areas. Marine parks are discussed in further detail in section 6(d) this chapter.

It is important to note that most class A endorsement holders and all class B endorsement holders in the Ocean Hauling Fishery, particularly the beach-based haulers, are further restricted to operating within one of seven regions along the NSW coast. The seven ocean hauling regions are identified in Map B1 and vary in size considerably along the NSW coast. Fishers were restricted to either their region of residence or the region of their historical participation with the introduction of a zoning scheme in 1995. Some boat-based garfish haulers are currently permitted to operate in more than one region to catch garfish from their boats. The class C (purse seine) endorsement holders in the Ocean Hauling Fishery are not restricted to any one region.



Map B1. Regions in the Ocean Hauling Fishery and ocean zones for reporting of commercial landings taken in NSW coastal waters.

3. Methods of Harvesting

a) Gear used in the fishery

Five types of net are prescribed in the *Fisheries Management (General) Regulation 1995* for use in the Ocean Hauling Fishery. The general dimensions of most types of nets are restricted and all nets used in commercial operations must be registered with NSW Fisheries. The nets are measured by Fisheries Officers from time to time and must comply with the length and mesh sizes detailed on the net registration certificate and/or the most current regulation.

More specific information relating to the size, design and other restrictions on the commercial fishing gear is outlined in the Regulation.

b) Types of boats used

Although previously dominated by beach-based fishers, technological advances in operations have led to an increase in boat-based operations in the fishery. In recent times there has been a notable shift in effort within the fishery, with traditional beach-based fishers extending their operation to include boat-based hauling, especially off headlands whilst targeting species such as sea garfish. As a result, fishing effort in the boat-based sector has increased considerably.

The boats used in the beach-based sector of the fishery vary broadly from the generally small 'run-about' or 'punt' style vessels to larger and faster 'jet boat' style vessels with motors up to 45 horsepower. The 'run-about' or 'punt' style vessels used in the fishery are often also used in the Estuary General Fishery. Some of the more powerful vessels used in the Ocean Hauling Fishery are sometimes also used in the Ocean Trap and Line Fishery.

Typical 'run-about' style vessels are generally between three and six metres in length. Vessels of this size constitute approximately 70% of the commercial fishing fleet in NSW (NSW Fisheries Licensing Database). Boats in this fishery can often simply be oar powered or have a small motor. The total number of fishing boats, and the relative age of the boats, currently used in the Ocean Hauling Fishery are unknown. As many fishers are beach-based, commercial catch records in recent years have not provided for the recording of vessel type and size.

The boats used in the boat-based hauling or purse seine sectors of the fishery are often a larger version of the typical run-about described above. However, another common type of vessel used in purse seining is between 10 and 50 tonne displacement volume and capable of handling the large catches which are sometimes part of the purse seine operations.

c) Operation of fishing gear in the fishery

The following descriptions of each gear type permitted in the fishery outline the construction of gear, how it is operated, some of the controls that apply, the main species taken, some of the bycatch (discards) and the seasonal patterns of use.

i) Hauling nets

A hauling net consists of a length of mesh secured to a headline (or "cork line") on the top, and a footline (or "lead line") on the bottom. Attached to each end of the net is a set of long rope hauling lines, which are used to pull the net through the water.

A hauling net is generally made up of two "wings" which are the pieces of netting located closest to the hauling lines, and the "bunt" of the net and "cod-end" which is the bag in the centre used to hold most of the fish during the haul.

The method of hauling involves the use of a boat to lay out the net in a semi-circle around a school of fish. This practice is known as a 'shot'. Once the shot is complete, both ends of the net are pulled towards the shore or the boat, either by means of being pulled by hand or with the aid of motorised line haulers, tractors or four wheel drive vehicles, effectively herding the fish into a central bag or 'bunt' of the net. The intention is to herd the fish, but to avoid trapping them in the mesh of the net, which can damage the fish as well as making the hauling process more difficult. Once hauling of the net has commenced (i.e. when any part of the net other than the hauling line has been shot), it must be continued without any interruption or delay, until completed. Any fish contained in any part of the net must be immediately removed on completion of the haul, or on removal of that part of the net from the water, whichever occurs first.

Beach hauling often involves the observation of a school of fish as they aggregate near a headland or rocky promontory. Such aggregations cannot be caught until they move away from the headland, up the beach. Hauling teams place spotters on headlands to detect this movement and make certain the hauling team is ready to shoot the net. In such circumstances, the net may be shot in a way that means the net will haul along the sand directly adjacent to the reef or headland. Hauling fishers avoid hard substrate because it damages hauling nets causing expensive repairs and loss of product. Some species commonly found on rocky reefs will aggregate with the school of fish as they pass the headland and be caught in small numbers in some haul shots (e.g. silver drummer or rock blackfish).

A system has been devised to reduce conflict between crews of fishers on sea beaches for commercial fishing. This commonly involves a beach hauling crew consisting of four or more endorsed fishers receiving 'priority of shot' over smaller crews. For example, if a crew of two fishers has not commenced shooting their net and a crew of four fishers arrives, the first crew must make way for the larger crew, therefore relinquishing priority of shot.

Following is a description of the specific types of hauling nets used in the Ocean Hauling Fishery and their characteristics. All nets used in Ocean Hauling Fishery must be registered and comply with dimensions on the registration (and may be less than maximum allowable size or more than the minimum regulation size restrictions).

General purpose hauling net

General purpose hauling nets are made from netting material varying in mesh size, with a minimum mesh of 50 mm in the bunt and a minimum mesh of 80 mm in the wings of the net. The length of each hauling line attached to the net does not exceed the total length of the net to which it is attached. The net is shot from the stern of a small boat, which travels away from the beach, then returns in a semi-circle back to the beach. The net is then hauled back to the beach or shallow water in a continuous operation by hand or with motorised winches.

Modifications to the mesh size of this net were introduced in 1998 for the sea mullet "travelling season" (1 March to 31 July of each year) to prevent the net mesh size from targeting large female sea mullet. The measurements of the travelling season net are 50 - 65 mm in the bunt, 65 - 86 mm in the wings, with the maximum length of the net not to exceed 400 m. In ocean waters and on sea beaches the bunt of the net must not exceed 1/3 of the total length of the net, excluding hauling lines.

This net type is predominantly used to catch sea mullet, however, it is lawful to retain a broad range of species, including bream and luderick, caught in this net whilst it is being used in ocean waters.

Although minimum mesh sizes apply to general purpose hauling nets, the impact of hauling on bycatch species or organisms not retained by the net are generally unknown.

Pilchard, anchovy and bait net

This type of hauling net is designed for taking small species of fish and it is used predominantly in the Ocean Hauling Fishery to take pilchards, yellowtail, blue mackerel and whitebait (sandy sprats). It is lawful to use this hauling net for taking other fish (not including garfish, prawns or a prohibited size class of fish), provided that the net is used only by the method of hauling and the mesh size throughout is not less than 13 mm. It has a central bunt or 'cod-end' in which the fish are collected during the hauling operation. The mesh decreases in size as the net tapers into the cod-end.

Although these nets have historically been worked from ocean beaches, they have more recently been adapted to boat-based activities.

Garfish hauling net

A garfish hauling net is a net specifically designed to catch garfish. It is operated in the Ocean Hauling Fishery as a conventional hauling net and is positively buoyant to target surface-schooling sea garfish. It is lawful to use this hauling net to take fish in ocean waters including parts of Botany Bay and Jervis Bay. Any species of fish (not including a prohibited size class of fish) may be retained only when the net is being used for taking garfish.

Although these nets have historically been worked from both ocean beaches and ocean going vessels they have recently been increasingly used in boat-based activities.

The permissible mesh size dimensions of a garfish hauling net is limited to 28 mm or more. Mesh size restrictions are used to prevent the capture of small fish or non-target species. Fishers claim that garfish caught in a 28 mm net are often damaged or injured because the net acts to mesh the fish rather than herd them, and that this reduces the quality of product for the export market. Nets with a mesh size of 25 mm are claimed to provide a better quality product by reducing the incidence of meshing while still avoiding the incidental capture of other fish species.

A concession to use 25 mm mesh in garfish hauling nets has been in place since 1995. Although the *Fisheries Management (General) Regulation 1995* specifies the minimum mesh size in a garfish net to be 28 mm, the concession has permitted a tolerance of up to 3 mm. There are currently no permits issued to allow fishers to use a 25 mm mesh size.

Garfish net (bullringing)

The garfish bullringing net is positively buoyant and used to surround schools of fish. The headline has floats attached and the footline is weighted so that the net sits vertically in water. The net is set by attaching one end to a fixed point with the headline being attached to a float and the footline being attached to an anchor. The net is then 'shot' or layed out in a circular motion until a school of garfish is encircled. Once the net has been shot and the school is enclosed, the hauling in of the net commences.

The last end of the net to be set is hauled in first until the retrieval rope is reached. The retrieval rope is then pulled in which causes the bottom of the net to be closed off underneath the fish. The remainder of the net is then pulled alongside the fishing boat and the garfish scooped on board. Any catch to be returned can be released at this time.

This net can only be used between 1 February and 30 November in any year. In ocean waters, the total length of net must not exceed 275 m, with mesh throughout not less than 28 mm nor greater than 36 mm. Garfish is the only species permitted to be kept using this net type.

ii) Purse seine nets

Purse seine nets are used from boats around 5 - 15 m in length in near shore ocean waters along the whole of the NSW coast to encircle and capture surface schooling fish. A purse seine is a wall of netting, which is set around a school of fish. The top side is hung from a rope fitted with floats (floatline), and the bottom side is weighed down by a leadline. The leadline is fitted with rings (purse rings) which are hung from the leadline every five to eight metres. Through these rings passes a rope (purseline) which is pulled to bring the rings together and secure the net underneath the school before being hauled back to the boat.

In Twofold Bay and Jervis Bay, there are no mesh size restrictions, however, the total length of a purse seine net must not exceed 275 m. In all other ocean waters the mesh size throughout the net must not exceed 150 mm and the total net length must not exceed the length on the net registration.

Purse seine nets predominantly target species such as pilchards, yellowtail and blue mackerel. However, all other species may be retained with the exception of garfish, kingfish, tuna or a prohibited size class of fish, which cannot be taken.

iii) Lift nets

A lift net is used for collection of pilchards, blue mackerel and yellowtail only as bait for use when targeting tuna. It consists of netting that can be suspended from a rigid frame and is submerged below the vessel operating the net. Fish are attracted to the area using light and/or burly. Once sufficient baitfish have been attracted to the area immediately above the net, it is raised and the collected fish removed from the net.

Only commercially licensed fishers in NSW targeting tuna may operate a lift net to take bait for the tuna operation. A number of Commonwealth fishers, with either tuna longlining, poling or tuna purse seining Commonwealth permits, have been issued NSW commercial licences and restricted to a licence condition that only permits their use of a lift net to take bait for their Commonwealth tuna operations. Commonwealth fishers who have been issued NSW commercial licences in order to operate permits issued under section 37 of the *Fisheries Management Act 1994* to use purse seine nets to take bait may also use a lift net to take bait for use in Commonwealth tuna operations. For further details in relation to bait-for-own-use permits please refer to section 5(b) of this chapter.

d) Maintenance of fishing gear

Most commercial fishing gear used in this fishery is used on a seasonal basis and requires periodical maintenance when not being used. Nets can deteriorate through continued use in water, or they may become torn or entangled during their use, particularly when caught on snags or accidentally run over by boats. Mesh can often shrink over time when exposed to sunlight and need to be periodically replaced.

Most beach hauling nets require little maintenance as they are usually used over soft substrate with fewer potential snags to damage the net.

4. Catch Information

a) Catch levels and value

The Ocean Hauling Fishery is currently fished at a level that leaves little scope for expansion. Catches in the fishery have increased substantially from approximately 500 tonnes to greater than 3,300 tonnes over the last 15 years as the value of the once poorly regarded sea mullet has increased. The beach hauling fishery for pre-spawning sea mullet has now become one of the State's most valuable commercial finfish fisheries.

There were large changes in the landings of sea mullet during the early 1990's. Catches of sea mullet increased from 1,500 tonnes in 1992/1993 to greater than 3,000 tonnes in 1993/94, then returned to around 2,000 tonnes in 1994/95 and 1995/96. A high proportion (about 79%) of the catch of sea mullet is taken on the central to mid north coast of NSW and nearly all ocean catches are made in the months from March to June. A significant 'hardgut' (non-spawning condition) component of the fishery occurs during summer in some years.

The stocks of three major species in the purse seine fishery, including pilchards, yellowtail and blue mackerel, are mostly unknown at this time. Approximately 1,000 tonnes of fish were caught commercially by purse seine operators during the 1997/98 season. In recent years the total purse seine catch has generally remained stable, although catches of individual species have fluctuated. Combined annual landings of the four main species (pilchards, yellowtail, blue mackerel and sweep) have fluctuated between 640 tonnes and 1,700 tonnes during the past decade.

Total catches and total value of the Ocean Hauling Fishery are subject to some important qualifications. Since mid-1997, the mandatory catch and effort returns of fishers have been directly related to their activity in each fishery. However, prior to that time, catches were identified as either estuarine or oceanic in origin and it was often not possible to attribute catch to a particular fishery or method. For example, an ocean hauling fisher who also worked in the Ocean Trap and Line Fishery could take bream with either a hauling net or a fish trap, recording all ocean catches taken in a month on one catch return. Assigning value to species caught in the fishery is also problematic. Many species are caught in large volumes and are very likely to be destined for markets other than the large wholesale market in Sydney. This wholesale (for food) market is the primary source of price estimates used to estimate the value of fish landings. Mullet roe processors pay higher prices than "for food" markets, but only for female fish. Some purse seine catches are sold for bait, fishmeal or pet food and also have a different price structure.

The weight and value of catches reported in the Ocean Hauling Fishery for the financial year of 1997/98 totalled 4,638 tonnes and $7.2 million. For the financial year of 1998/99 the weight and value of catches in the fishery totalled 2,466 tonnes and $4.1 million (see Table G1 in Appendix G for an explanation of the basis of these value figures). In this report, no attempt has been made to correct prices for the many, known factors that will make Sydney Fish Market (SFM) prices inaccurate.

b) Definition of regions and reporting zones

The seven ocean hauling regions are identified in Map B1 and vary in size considerably along the NSW coast. The recording of catches in the Ocean Hauling Fishery demonstrates that fishers target different mixes of species in each of the regions along the state. Table B1 outlines the

variations in catches of some target ocean hauling species taken by either class A or class B endorsement holders along the ocean hauling regions in NSW.

Comparing catches between ocean hauling regions may only be done for methods that are restricted to regional boundaries, such as beach-based hauling. Catches taken by multi-zone garfish haulers or purse seine endorsement holders are not included in the ocean hauling regional catches of Table B1 as these endorsement holders may travel across the regional boundaries. Although many ocean hauling fishers are restricted to one of the seven defined ocean hauling regions, all commercial landings in the fishery are not reported by ocean hauling regions, but rather by the one-degree latitude ocean zones (see also Map B1), consistent with all other ocean fisheries in NSW. Table B2 outlines the variation in the catches of seven target species taken by all ocean hauling methods along the NSW ocean zones as defined in Map B1.

Table B1. Average production for years 1997/98 and 1998/99 by region for principal hauling species taken by general purpose or pilchard, anchovy and bait (PAB) hauling nets.

(Source: NSW Fisheries catch statistics database)

Ocean Hauling Region	Production (kgs)					
	Sea mullet	Sandy sprat (whitebait)	Pilchard	Australian salmon	Luderick	Bream
Region 1 NSW/QLD border to 29°15' S	114166	47210	64422	0	1747	743
Region 2 29°15'S to 29°45'S	107217	0	9836	0	1691	909
Region 3 29°45'S to 31°44'S	300411	6558	10221	232	32616	13619
Region 4 31°44'S to 33°25'S	765539	182	0	44043	20710	28665
Region 5 33°25' to 34°20'S	164828	4640	650	782	1593	377
Region 6 34°20'S to 35°25'S	65769	1306	9640	14551	5050	2065
Region 7 35°25'S to NSW/Vic border	219728	772	20914	143804	7450	4811
Total	**1737658**	**60668**	**115681**	**203411**	**70857**	**51188**

Note: Catches taken by purse seine nets or garfish hauling nets are not included in these figures.

Catches of Australian salmon are concentrated in the southern ocean hauling regions with small catches taken in the three northernmost regions and the largest level of catch taken in region 7 relative to all other regions. Sandy sprat (whitebait) catches are patchier with the largest catches taken in region 1. Pilchards are taken in largest quantities in the northern regions with no catches recorded in region 4 and very small quantities recorded in the lower regions. The largest catches of sea mullet are taken in region 4 but substantial quantities are taken throughout the State. Luderick is also taken throughout the state, however, the largest quantities are recorded in regions 3 and 4.

Table B2. Average production (from 1997/98 and 1998/99) by all ocean hauling methods in each ocean catch reporting zone for Ocean Hauling Fishery.

(Source: NSW Fisheries catch statistics database)

Ocean Zone	Production (kgs)						
	Sea mullet	Sea garfish	Blue mackerel	Australian salmon	Yellowtail	Luderick	Bream
Ocean zone 0 North of QLD/NSW border	34112	0	0	1	0	0	0
Ocean zone 1 QLD/NSW border to 29°S	83368	1054	4617	2897	292	1476	675
Ocean zone 2 29°S to 30°S	158082	2987	0	0	0	1740	3531
Ocean zone 3 30°S to 31°S	283848	3709	1136	175	113	35852	13516
Ocean zone 4 31°S to 32°S	551667	4798	1	12521	15	9266	9241
Ocean zone 5 32°S to 33°S	337025	40020	4321	30642	7371	17846	30131
Ocean zone 6 33°S to 34°S	190463	17359	16299	231	30655	1139	400
Ocean zone 7 34°S to 35°S	48891	20583	156367	25396	262051	2525	430
Ocean zone 8 35°S to 36°S	45972	10652	27408	42211	19746	3968	1304
Ocean zone 9 36°S to 37°S	24394	983	93735	41665	58188	1765	12
Ocean zone 10 37°S to NSW/VIC border	16967	2486	96946	53684	19270	1598	162
Total Weight (kgs)	**1774789**	**104631**	**400830**	**209423**	**397701**	**77175**	**59402**

The purse seine species, such as blue mackerel and yellowtail are taken predominantly in the southern half of the state. Sea garfish catches are taken in larger quantities in the central regions.

c) Catch by method

The 20 species taken most commonly in the Ocean Hauling Fishery, comprise more than 99% of the harvest in the fishery (see Table B3). The catch from each of the methods used in the fishery is dominated by a small number of species and two or three species usually make up more than 80% of landings for each method (see Table B3). The two main methods, general purpose hauling and purse seining, together take about 90% of the catch of the fishery.

Table B3. Landings for ocean hauling methods expressed as a percentage of the total catch for each method.

Percentages are based on average annual landings for the three years commencing July 1997. The species are the twenty with the highest total landings over the same period (99.1% of total landings) and are presented ranked from greatest to least within the fishery. Note that species named are based on reporting categories and may aggregate two or more species into a single category.

Species	Method Name				
	Garfish bullringing net	**Garfish hauling net**	**General purpose hauling net**	**Pilchard, anchovy or bait net**	**Purse seine net**
Sea mullet	0.0%	8.4%	76.5%	6.4%	0.0%
Blue mackerel	3.0%	1.8%	0.5%	16.2%	40.9%
Yellowtail	3.2%	1.2%	0.3%	7.5%	39.6%
Australian salmon	0.0%	3.6%	12.8%	0.0%	2.2%
Pilchard	1.1%	0.9%	0.4%	35.3%	9.3%
Sea garfish	90.1%	79.1%	0.2%	0.1%	0.2%
Luderick	0.0%	2.3%	3.3%	0.1%	0.0%
Sandy sprat (whitebait)	0.0%	0.0%	0.1%	24.7%	0.5%
Black and yellowfin bream	0.0%	1.4%	2.3%	0.3%	0.0%
Sweep	0.0%	0.0%	0.0%	0.3%	3.7%
Jack mackerel	0.0%	0.0%	0.0%	0.5%	1.4%
Whitebait (glass fish)	0.0%	0.0%	0.2%	3.8%	0.1%
Anchovy	0.0%	0.0%	0.1%	2.2%	0.8%
Tailor	0.0%	0.1%	0.6%	0.1%	0.0%
Dart	0.0%	0.1%	0.5%	0.1%	0.0%
Sand whiting	0.0%	0.1%	0.4%	0.0%	0.0%
Silver trevally	0.0%	0.1%	0.1%	0.0%	0.4%
Leadenall	0.0%	0.0%	0.3%	0.0%	0.0%
Bonito	0.0%	0.0%	0.1%	0.1%	0.3%
Fantail mullet	0.0%	0.0%	0.2%	0.0%	0.0%
Top 20 as percentage of total catch for method	97.5%	99.2%	99.0%	97.6%	99.5%
Average annual total tonnes	13.8	78.0	1880.4	217.9	948.7

5. Existing Management Strategy

a) History and status of commercial fisheries management in NSW

Controls on commercial fishing in NSW date back as far as 1865 when the first fisheries legislation was introduced. Since that time, several Acts have been introduced to improve the ability to manage impacts of fishing. The *Fisheries & Oyster Farms Act 1935* provided a good set of management tools, such as licensing rules, gear controls and fishing closures, and was in force for some 60 years.

With the advent of new technology and ongoing increases in effective fishing capacity, more contemporary management regulations were needed. The *Fisheries Management Act 1994* replaced the *Fisheries & Oyster Farms Act 1935* and provided a more comprehensive instruments to manage fisheries. Table B4 below provides an insight into the historical development of fisheries management in NSW.

Table B4. Chronology of major fisheries management events in NSW.

Year	Management event
mid-1800s	Commercial fishing commenced in NSW estuaries
1865	*Fisheries Act 1865* commenced in response to concerns of overfishing, enabling the declaration of seasonal and area fishing closures
1881	*Fisheries Act 1881* commenced, allowing for the regulation of fishing gear, including controls over mesh sizes in nets, and the licensing of fishers and fishing boats
1935	*Fisheries and Oyster Farms Act 1935* introduced
1980	Access to abalone fishery limited
1984	Freeze on the issue of new fishing boat licences introduced
1986	Access to estuary and offshore prawn trawling limited
1987	Freeze on the issue of new fisher licences ("commercial fishing licences") introduced
1990	Warning issued by Government against new investment and/or new diversification in commercial fishing activities
1993	Access to the Rock Lobster Fishery limited
1994	Licensing Policy introduced, commencing the process of catch validation
1995	Commencement of the *Fisheries Management Act 1994* which provided for the establishment of 'share management fisheries' and 'restricted fisheries'. Ocean Hauling developed into a restricted fishery.
1996	1994 Licensing policy revised and re-issued
1997	Restricted fisheries introduced for major marine commercial fisheries: Ocean Prawn Trawl, Ocean Fish Trawl, Ocean Trap & Line, Estuary Prawn Trawl, Estuary General. Purse seining was incorporated into the Ocean Hauling Fishery. (NB. the Abalone and Rock Lobster fisheries were declared share management fisheries)
1997	Commencement of three year phase-out of pound net fishing method
2000	Commencement of share fishery management plans for the abalone and lobster fisheries
2000	Amendment to the *Fisheries Management Act 1994* provides an alternate management framework called category 2 share management fisheries
2001	Declaration of Recreational Fishing Areas

The *Fisheries Management Act 1994* provides several broad frameworks for managing commercial fisheries including category 1 and category 2 share management fisheries and restricted fisheries. Each framework provides a different level of access right along with different levels of cost and responsibility for industry. Table B5 provides a comparison between the three management frameworks.

Table B5. Comparison of the restricted fishery and share management fishery frameworks.

* exceptions apply in some fisheries where validated catch history is not required to hold the endorsement

	Restricted fishery	Category 1 share management fishery	Category 2 share management fishery
Right issued	Validated catch history which gives rise to an "entitlement"*	Shares	Shares
Access	Endorsement	Endorsement	Endorsement
Transferability	Subject to transfer policy	Subject to the management plan	Subject to the management plan
Statutory compensation payable?	No	Yes, if shares are cancelled	Yes, if shares are cancelled
Statutory management plan required?	No	Yes, 5 year plan	Yes, 5 year plan
Appeal mechanism	Statutory review panel	Statutory review panel	Statutory review panel
Cost recovery	Partial; moratorium on full cost recovery	Full cost recovery	Partial; full cost recovery after 8 years
Community contribution payable?	No	Yes	Small rental payment

The Ocean Hauling Fishery has been declared a category 2 share management fishery, and the process of conversion from the existing restricted fishery framework is underway.

b) Controls on fishing activity

No formal management plan currently exists for the Ocean Hauling Fishery, however, there are numerous management controls that apply to the fishery.

There are two broad types of fishery management controls, known as input controls and output controls. Input controls limit the amount of effort commercial fishers put into their fishing activities, indirectly controlling the amount of fish caught. They need to continually be modified in response to fishing technology. Input controls can include restrictions on the number of licences, the size and engine capacity of boats, the length and mesh size of nets, and the areas and times which can be worked. Output controls, on the other hand, directly limit the amount of fish that can be taken from the water and are well suited for single species, high value fisheries using single gear types (Goulstone, 1996).

The Ocean Hauling Fishery in NSW is managed predominantly by input controls. The controls in place are diverse. The following section sets out in broad terms the controls that apply to activities in the fishery.

i) Licences required in the fishery

A commercial fishing licence is required by an individual before he/she can take fish for sale or be in possession of commercial fishing gear in or adjacent to waters. The licence only authorises

activities that are covered by the endorsements, issued in respect of each part of fishery and specified on the licence.

Generally speaking, commercial fishing licences are currently available to persons who held a licence immediately prior to the commencement of the *Fisheries Management Act 1994*, owners of recognised fishing operations (RFO), or the nominated fisher of an RFO (see section 5(b)(viii) of this chapter for further details on the nomination policy). An RFO is a business with a minimum level of validated catch history. The RFO policy was introduced via the Licensing Policy issued by NSW Fisheries in June 1994.

The common objectives of the 1994 Licensing Policy and its replacement in 1996 were to:

- provide transitional arrangements which do not pre-empt future management whilst longer term management arrangements are being introduced
- provide a mechanism which allows existing fishers with catch history to identify and subsequently dispose of their fishing business/es
- allow new entrants into the industry in a manner which ensures that active fishing effort only is being replaced
- provide a mechanism for the consolidation of smaller fishing businesses.

The RFO policy has been effective at restructuring and consolidating fishing businesses at the lower end of the income range and has been delivering on the objective of promoting a viable commercial fishing industry (Murphy, 1999).

ii) Limited entry

Access to the Ocean Hauling Fishery has been limited to eligible fishers since the restricted fishery regime commenced for class A (skipper) and class B (crew) sectors of the fishery on 1 March 1995 and for the class C (purse seine) sector on 1 March 1997. Prior to these dates, nearly every NSW fisher with a general commercial fishing licence could operate in the Ocean Hauling Fishery.

Entry to the Ocean Hauling Fishery under the restricted fishery regime for most methods was defined by having a minimum level of catch history showing that the methods sought in the application had been actively used over past years. Ownership of nets and net registrations was also important in distinguishing eligibility for classes of endorsements and net authorities in the Ocean Hauling Fishery. An extensive statutory appeals process followed.

Following changes to the *Fisheries Management Act 1994* in December 2000 the Ocean Hauling Fishery, along with most other major commercial fisheries, was selected to become a category 2 share management fishery. At this moment, the fishery is operating under the restricted fishery regulations, with the same rules and obligations that have applied since 1997. This situation will continue until a share management plan for the fishery has been made by regulation. Further information relating to the progression to full share management can be found in section 6(a) of the draft FMS.

iii) Fishing endorsements

In determining the number of fishers in the Ocean Hauling Fishery, it is important to understand the difference between endorsements and entitlements in the fishery and how they relate to commercial fishing licences.

In summary, entitlements in the fishery are associated with fishing businesses, whilst endorsements appear on commercial fishing licences allowing fishers the right to use of specific gear or taking specific species. Further information on endorsements and entitlements are presented in other parts of this chapter including 5b(i) *Licences required in the fishery* and 5b(viii) *Nomination policy.*

Some fishing businesses are owned or held by more than one individual (as in the case of companies or partnerships), and therefore an entitlement associated to a business may have more than one fisher's licence endorsed to use a certain method.

There are four types of endorsements in the Ocean Hauling Fishery. Table B6 below defines the endorsement types and the gear eligible to be used under each endorsement type.

In 2001 a new class of endorsement (class D) was introduced which allows species of fish, specified on the endorsement, to be taken for sale by purse seine net from state waters north of latitude 32° South. Although the criteria period for the allocation of class C (purse seine) endorsements was 1986 to 1990, it was recognised that the delayed development of baitfish markets in northern NSW restricted those who had fished north of 32° South from meeting the criteria. Consequently, the catch history criteria period for the class D endorsement was extended to cover the period 1986 to 1993. Although the introduction of the new class of ocean hauling endorsement allowed the entry of additional commercial fishers into the fishery, restrictions on the species to be taken and the area of operation are placed on the endorsements.

Table B7 outlines the numbers of fishers in each of the three classes of endorsements that existed in May 2001, including class A (skipper), B (crew) and C (purse seine). Table B7 also highlights numbers of fishers holding one or more of the four possible net authorities that are associated with class A (skipper) endorsements.

Conditions may be placed on endorsements to further restrict or manage the activities of fishers. For example, fishers holding either class A (skipper) or class B (crew) endorsements are subject to an endorsement condition included on the licence preventing fishers from working on ocean beaches during weekends or public holidays during the period of 1 November each year to the last day in February in each consecutive year. Class C (purse seine) endorsement holders are not subject to the licence condition whist undertaking purse seining activities.

Table B6. Description of endorsements in the Ocean Hauling Fishery.

Endorsement types	Endorsement description
Class A (skipper)	This endorsement authorises the commercial fisher to take fish for sale in a particular region using one or more types of hauling net authorities specified below where included on the endorsement. The fisher may also assist another person who holds a class A endorsement with the appropriate net authority that authorises the other person to use that net in that region
	General Purpose net authority- authorises the holder to take fish (other than lobster and abalone) using a general purpose hauling net as defined in the *Fisheries Management (General) Regulation 1995*
	Garfish Hauling net authority- authorises the holder to take fish (other than prohibited size class of fish, lobster or abalone) using a garfish hauling net as defined in the Regulation
	Garfish (Bullringing) net authority- authorises the holder to take garfish using a garfish bullringing net as defined in the Regulation
	Pilchard, Anchovy and Bait net authority- authorises the holder to take fish (other than prohibited size class of fish, garfish, prawns, lobster or abalone) using a garfish hauling net as defined in the Regulation
Class B (crew)	This endorsement authorises the commercial fisher to take fish for sale using a hauling net in a particular region, but only if the holder is assisting another person who holds a licence with a class A endorsement and with the appropriate net authority to use that net in that region
Class C (purse seine)	This endorsement authorises the commercial fisher to take fish for sale using a purse seine net from ocean waters within 3 nm of the natural coastline and the waters of Jervis Bay
Class D (purse seine north)	This endorsement authorises the commercial fisher to take fish for sale using a purse seine net from ocean waters within 3 nm of the natural coastline and north of latitude 32° South

Table B7. Number of commercial fishers endorsed in each sector of the Ocean Hauling Fishery.

(Source: NSW Fisheries Licensing Database, as at May 2001)

Endorsement type		Number of businesses with endorsements							Total
		Region 1 Border to 29°15'S	Region 2 29°15'S to 29°15'S	Region 3 29°45'S to 31°44'S	Region 4 31°44'S to 33°25'S	Region 5 33°25'S to 34°20'S	Region 6 34°20'S to 35°25'S	Region 7 35°25'S to Border	
Class A (skipper) **	Hauling net (general purpose)	10	16	28	60	14	24	16	168
	Garfish net (hauling)	1	2	7	26	12	27	7	82
	Garfish net (bullringing)	0	1	0	7	2	7	4	21
	Pilchard, anchovy and bait net	9	4	10	8	11	4	0	46
Class A (skipper) total		10	16	28	63	14	33	13	**184***
Class B (crew) total		17	22	28	70	14	28	22	**203***
Class C (purse seine) total		N/A	N/A	N/A	N/A	N/A	N/A	N/A	**26***

*Includes those who have class A and class C endorsements and those with a class B (with special arrangements) and class C endorsements.

**Those who have been allocated a class A endorsement may hold more than one net authority.

Note: Those fishers holding a class B (with special arrangements) may hold one or more net authorities normally only associated with the class A endorsement.

iv) Controls on fishing gear and boats

Detailed restrictions relating to the dimensions and type of fishing gear are set out in the *Fisheries Management (General) Regulation 1995*. The Regulation provides for the use of 'standard' gear and any variations to the standard gear that may be required in different areas along the NSW coast and also stipulates in many cases how the gear must be operated.

Fishing boat licensing

In addition to each fisher having to be licensed, every fishing boat used in connection with the Ocean Hauling Fishery must also be licensed. There has been a cap on the total number of boat licences used in NSW commercial fishing since 1984.

To prevent the increase in size and therefore efficiency of vessels in the fishery, a strict boat replacement policy applies[2]. Boats 5.8 m in length or less may be replaced with boats up to 5.8 m. Boats that are greater than 5.8 m in length may only be replaced with boats that are no more than 10% or one metre greater in length, whichever is lesser. The 10% tolerance continues to relate to the original boat length to avoid a progressive increase in boat length over time.

Engine controls

In early 1997 there was an attempt to cap escalating effort in the beach haul sector. This was done by instituting a closure which limited beach-based ocean hauling fishers to using an engine unit of not more than 45 horsepower. This closure is still in place however , there is concern that the technical calculation of horsepower allowed some fishers to comply with the wording of the closure, but not the intent. These fishers may have installed higher capacity engines and circumvented the closure.

Net registration

Commercial fishing nets used in the Ocean Hauling Fishery are required to be registered. Net registration certificates are issued for individual nets and are valid for the life of the net. The certificates stipulate the length and mesh sizes of individuals.

New (i.e. additional) net registrations have not been issued since a freeze was placed on the registration of new nets in July 1989.

Net registrations are not transferable and are only issued for new nets that are replacing existing nets, that are no longer serviceable and of the same specifications. Where nets are acquired as part of the transfer of a fishing business, only the nets authorised for use under the new owner's entitlements will be registered.

v) National licence splitting policy

The Commonwealth and the State Governments have a long standing nationally agreed policy in place on licence splitting. The policy prevents entitlements held by one person or entity and issued by more than one jurisdiction, from being split and transferred separately. The transfer of a fishing business is not approved unless all entitlements issued to the business by other jurisdictions are also

[2] This policy has been in place since the introduction of the June 1994 Licensing Policy, and several variations to the policy apply prior to that.

transferred to the same person, surrendered, or if the approval of all agencies involved has been obtained.

Where fishing effort has been historically 'shared' across a number of entitlements held by a person, the policy prevents the increase in effort that would occur by creating two separate entitlements that could operate at full capacity.

vi) Transfer of licensed fishing boats

The majority of licensed fishing boats used in the Ocean Hauling Fishery are small and are classified as "general purpose" boats. Boats in this category do not carry validated catch history and can be transferred separately to the other entitlements of the fishing business. In general, boats have been categorised as general purpose vessels where the fisher, rather than the boat, was considered to be the predominant unit of fishing effort.

On the other hand, boats that are categorised as "boat history" vessels cannot be transferred separately to the fishing business. The Licensing Branch can advise a fishing boat owner whether a boat has been classed as a boat history or general purpose vessel. Any transfer of a fishing boat licence must first be approved by the Director of NSW Fisheries.

vii) Transfer of fishing business entitlements

Commercial fishing licences and endorsements to participate in a fishery are not freely transferable. Currently, commercial fishing licences and endorsements only become available to a new entrant if a fishing business with the required level of validated catch history is acquired (i.e. an RFO). A restrictive transfer policy was in place for class A (skipper) and class B (crew) sectors of the fishery from when they were first issued in the Ocean Hauling Restricted Fishery in March 1995 until April 2000. The policy prevented the issue of all endorsements to new owners of fishing businesses, except skipper endorsements which were only issued if the previous owner died or demonstrated serious illness. The restrictive transfer policy has not been applied to the class C (purse seine) sector of the fishery.

The restrictive transfer policy was necessary to prevent endorsements which were granted under an extremely low entry criteria from being issued to new owners of fishing businesses and utilised at much higher levels.

Following requests to provide greater industry flexibility, a transferability discussion paper was developed in consultation with the Ocean Hauling Management Advisory Committee (MAC) and circulated to all ocean hauling endorsement holders for comment in August 1998. After considering the responses, the MAC made a series of recommendations to the Minister for Fisheries about future transferability rules that were approved and implemented in April 2000.

The new transfer policy specifies not only whether a new fishing business owner is eligible to hold a class A or class B ocean hauling endorsement, but it also outlines the authorised net types that become available to a new endorsement holder should a class A endorsement be available.

The following transfer policy guidelines currently apply to class A and class B endorsements:

Entitlements in the Ocean Hauling Fishery will only be issued to new owners of fishing businesses (or their nominated fishers) under the following circumstances:

(1) ocean hauling catch history must be transferred as part of an entire fishing business(2) skipper endorsements and associated net authorities will be issued only if the following criteria are satisfied:

(i) the fishing business contains a minimum of 7.5 tonnes of catch history♣ and a minimum of eight ocean catch returns with the relevant method recorded between 1986 and 1990 for a hauling net (general purpose) authority

(ii) the fishing business contains a minimum of two tonnes of catch history♣ and a minimum of eight ocean catch returns with the relevant method recorded between 1986 and 1990 for a pilchard, anchovy and bait net authority

(iii) the fishing business contains a minimum of one tonne of catch history♣ and a minimum of eight ocean catch returns with the relevant method recorded between 1986 and 1990 for a garfish net (hauling) and garfish net (bullringing) authority

(3) a class B (crew) endorsement will be issued if the fishing business contains a minimum of six ocean catch returns with the relevant method recorded between 1986 and 1993 and at least one of those returns occurs prior to January 1991

(4) fishing businesses which previously held a class A (skipper) endorsement but fail to satisfy the criteria specified in clause (2) are eligible to hold class B (crew) endorsements

(5) class A (skipper) endorsements will only be issued to fishers who can demonstrate they have at least two years of ocean hauling experience (as a skipper or crew member on at least two catch returns in each year). Persons who do not have this experience will be issued with a crew endorsement for a two year period ("the training period"), after which time a class A (skipper) endorsement will be issued

(6) irrespective of the number of fishing businesses with class A or B entitlements owned, licence holders will only be endorsed to operate in a single nominated region, as specified in the endorsement, in any one year

(7) entitlements will only be issued to fishing businesses that previously held (at some stage since 1 March 1995) the endorsement or net authority sought

(8) the region of operation specified in an endorsement will not be altered, irrespective of the residential location or intended fishing area of the new owner. For fishing businesses that are endorsed to operate across a regional boundary, the single whole region that was initially allocated in 1995 will apply immediately to any new endorsement issued

(9) permits or concessions previously issued are not transferable to the new fishing business owner

(10) the following ocean hauling transfer fees additional to the general boat licence transfer fees must be paid with the transfer application under these guidelines:

- Application for a class A endorsement - $416
- Application for a class B endorsement - $104

♣ This is catch history nominated by the fisher for that net type and agreed by NSW Fisheries. Note: Once agreed, catch history cannot be altered in the future.

(11) applicants who are not satisfied with determinations made under this policy can appeal to the Director within 60 days after receiving notice of the determination. An appeal fee of $104 applies.

While the class A (skipper) and B (crew) sectors of the Ocean Hauling Fishery are subject to the new transfer guidelines, the class C (purse seine) sector of the fishery remain subject to that part of the Licensing Policy known as the "interim transfer policy". Under the interim transfer policy, a new owner of a fishing business would be eligible for the class C endorsement associated with a business, should it meet the participation criteria. The interim transfer policy currently specifies that the class C endorsement of a fishing business will become available only to the first new owner of the business. If the business is transferred for a second time, the offer to retain the class C endorsement lapses. The purpose of the interim transfer policy is to allow for the limited transferability of fishing businesses whilst the MAC develops longer term criteria for transferability.

Under the current Licensing Policy, fishing businesses must be sold as an entire package (i.e. the catch history, boat history vessels and/or endorsements associated with boats cannot be split). Proposals regarded as licence splitting, or contrary to the intention of the Licensing Policy are not approved.

viii) Nomination policy

Part of the introduction of the restricted fishery regime was the creation of rules to allow the endorsements of a fishing business to be nominated to a person. This was necessary due to fishing businesses being held in company or partnership names and because fishing licences can only be issued to natural persons. This issue is more relevant in the more capital intensive ocean fisheries. Only 7.1% of fishing businesses with endorsements in the Ocean Hauling Fishery are held in partnership or company names, and many of these are endorsed also in the larger boat-based fisheries (NSW Fisheries Licensing Database- May 2001).

The three sectors of the Ocean Hauling Fishery are subject to two separate policies in relation to nominations. Under the current general nomination policy, if the owner of an ocean hauling fishing business is eligible for a class C (purse seine) endorsement, the owner may nominate another person to take fish on behalf of the business. This policy has been in place since 1997 when the class C (purse seine) sector of the fishery was incorporated in the fishery.

Long term nominations in the class A and class B sectors of the Ocean Hauling Fishery were not permitted between 1995 and April 2000. However, clause 212N of the *Fisheries Management (General) Regulation 1995* provided for short term nominations for those commercial fishers holding either class A (skipper) or class C (purse seine) endorsements in cases of sickness or other extenuating circumstances.

Following the implementation of the ocean hauling transfer guidelines in April 2000 for businesses with either class A or class B endorsement, long term nominations are now permitted provided the fishing business meets the criteria set out in the transfer guidelines for the appropriate class of endorsement. This includes the requirement for people without sufficient experience in the fishery to operate in a class B (crew) position for a two year period.

In all cases, if a person nominates another fisher to take fish on his/her behalf, that person forgoes his/her right to fish (under all endorsements) while the nomination is active.

As at July 2001, 18 fishing businesses with ocean hauling endorsements had a nominated fisher operating the business. Of these, seven businesses had not activated the ocean hauling endorsement associated with the business. Of the 11 fishing businesses with active ocean hauling nominations, three held a class C (purse seine) endorsement, seven held a class A (skipper) endorsement and two held class B (crew) endorsements (one fishing business held both class A and class C endorsements).

ix) Zoning

When the fishery was first restricted in 1995, a zoning scheme was introduced in the beach-based sector to alleviate conflict among commercial fishers and between commercial fishers and other resource user groups. The intention of the zoning scheme was to restrict the activities of all class A and class B endorsement holders to one of seven regions along the NSW coastline. Exemptions to the zoning rules were provided to boat-based garfish haulers who were identified as 'historical travellers' and all class C (purse seine) endorsement holders. Conflict in those boat-based sectors was less common at the time.

The zoning structure has resulted in a significant reduction in conflict. In addition to promoting harmony in the fishery, zoning focuses management and research on regional aspects of the biological, social and economic issues affecting the fishery. Local issues can be addressed in a way that meets the requirements of local groups within a State-wide framework.

In December 1997, the Ocean Hauling MAC recommended that all boat-based haulers also be restricted to a single region. In 1998, the then Minister for Fisheries approved the recommendation from the MAC, however, the decision was deferred pending a review of boat-based activities in the fishery. In August 2001, the Ocean Hauling MAC reinforced their decision and recommended that the implementation of zoning on boat-based fishers be undertaken in the immediate future.

x) Time and area closures

The *Fisheries Management Act 1994* provides for the use of fishing closures in the Ocean Hauling Fishery to, among other things:

- protect and conserve areas of key habitat
- manage the amount of fishing effort in an estuary
- to manage conflicts between stakeholders over the use of the resource and to ensure it is equitably shared
- minimise bycatch and the impacts of the fishery on threatened and protected species.

Fishing closures can be established on a seasonal, time, area, operator or gear specific basis. There are numerous fishing closures in place in NSW which limit fishing in the Ocean Hauling Fishery. Appendix B2 outlines the closures that may impact on ocean hauling operations.

Fishing closures are required to be published in the NSW Government Gazette, however, if the Minister for Fisheries considers that a fishing closure is required urgently, the Minister for Fisheries may introduce the closure and advise the public through media outlets and by displaying prominent signs in areas adjacent to the waters affected. In the case of an urgent closure, the Minister for Fisheries is to publish the closure in the Government Gazette as soon as practicable.

xi) Permits

Section 37 of the *Fisheries Management Act 1994* allows for permits to be issued for research or other authorised purposes. These permits provide a legal framework for activities that fall outside normal operating rules set out in the Act or its Regulation. Each permit sets out a number of conditions, which vary depending on the purpose of the permit. These conditions ensure that permits are used only for the purpose intended by his/her issuing and are often used to limit the extent of the permitted activity. The permits that may be issued in relation to the Ocean Hauling Fishery are outlined in Table B8.

Permits issued under section 37 of the FM Act are only valid insofar as they do not conflict with approved determinations of native title made under the Commonwealth *Native Title Act 1993*. Permits are valid for the period specified on the permit, and may be suspended or cancelled at any time by the Minister for Fisheries. Permits are not transferable.

Bait-for-own-use permits

The current Licensing Policy provides for the taking of bait species in NSW State waters by Commonwealth boats used for bait as part of a Commonwealth tuna operation.

The licences are issued only for the taking of 'bait-for-own-use' by vessels which hold the following specific Commonwealth tuna endorsements:

1. Tuna long line permit (*Historical- PLL, TEC 56A and Northern Inshore –PLL, TEC 56B*);

   Boats in this category and their skippers may apply for licences to take yellowtail and blue mackerel as 'own use bait'.

2. Poling (Permit which allows access to waters adjacent to NSW), or tuna purse seine permits (*Northern Inshore –PS, TEC 75A).*

   Boats in this category and their skippers may apply for licences to take pilchards, yellowtail and blue mackerel as 'own use **live** bait'.

Table B8. Permits currently issued in the Ocean Hauling Fishery.

Permit type	Description
Research	Permits are issued to research scientists (including NSW Fisheries staff, universities and other research organisations) and commercial fishers assisting in undertaking research programs. The permits generally authorise the retention of prohibited size fish, fish in excess of the possession or bag limits or use of gear not prescribed in the Regulation
Development of new fishing gear	This permit provides a legal framework for the possible development of more selective or passive fishing methods. Permits are often required to trial types of fishing gear with dimensions or configurations not prescribed in the Regulation. Permits may be issued to facilitate industry in developing alternate fishing practices in line with the goals of the Act and existing policy
Bait for own use	These permits provide for Commonwealth boats to take bait from NSW waters for use in Commonwealth tuna operations. See below for further details
Whitebait permits	Whitebait permits allow for historical users of whitebait nets to continue in a few estuaries and limited areas of ocean waters. See below for further details
Squid hauling in Jervis Bay	These permits also provide for those haulers who have historically participated in squid hauling Jervis Bay to continue to do so using hauling nets of 1000 m in total length. See below for further details

The NSW state licences restrict Commonwealth operators to taking bait for own use by means of a hook, line or submersible lift net for the purpose of taking tuna in Commonwealth waters. Where the Commonwealth operations meet the set historic use criteria and holding a State licence they may be issued a section 37 permit (provided for under the FM Act) to use a purse seine net in NSW waters to take bait for own use in their Commonwealth tuna operations.

The description and dimensions of a submersible left net and a purse seine net are specified within the Regulation.

Whitebait permits

Section 37 permits have been issued authorising the use of an adapted form of a pilchard, anchovy and bait net (commonly referred to as a whitebait net) to only take pilchards, anchovies, whitebait (including sandy sprat and glassies) and krill. The permits have been issued to a limited number of commercial fishers who have demonstrated historical use of the nets.

As at July 2001, permits were issued to 15 fishers enabling the use of a hauling net with small (13mm) minimum mesh size to target whitebait. Managing the use of this gear type through permits rather than by Regulation provides a control on the overall number of fishers able to use the net. Conditions on the permit restrict commercial fishers to work in only a few specified estuaries and limited areas of ocean waters within regions 5 and 6 and require fishers to notify their local Fisheries Office 24 hours prior to use of the nets.

Squid hauling permits in Jervis Bay

Permits have been issued to a small number of ocean haulers (i.e. four current permits issued) allowing those fishers who have historically hauled for squid in Jervis Bay to continue to do so. Licensed fishers working the waters of Jervis Bay have historically used general purpose hauling nets with a total length of 1000 m.

The intention of the permit is to allow fishers to use a small size mesh in the bunt of the net for targeting squid only. The permit allows fishers to retain fish if the length of the bunt is 90 m or under. Only squid may be retained where the length of the bunt is over 90 m, and all fish must be returned to the water immediately upon landing the net.

Specific dimensions of the net are outlined within the conditions of the permits and permit holders must abide by these conditions.

xii) Code of conduct

Ocean hauling fishers in the beach-based sector have operated within a series of local rules developed through trial and error over many years to promote harmony between beach haulers and the surrounding community. The voluntary system did not overcome the conflict issues and Councils were consequently threatening the withdrawal of access to more beaches.

Various drafts for a single code of conduct for the Ocean Hauling Fishery date back to at least 1992. The first mandatory code of conduct for ocean hauling commercial fishers (applying primarily to the beach-based sector), however, was only implemented with the introduction of restricted access to the fishery in 1995.

A condition on all class A (skipper) and class B (crew) endorsements is that an approved code of conduct, reviewed and updated each year, is adhered to.

The code of conduct covers issues like vehicle speed limits on beaches, use of agreed access points, avoiding environmental damage and incorporates local arrangements with Councils. A copy of the ocean hauling code of conduct for 2001/02 is included in Appendix B3. It is reviewed and where necessary, amended each year in consultation with the Ocean Hauling MAC and in response to issues that arise relating to the operation of ocean hauling businesses.

Interaction with tourists and other beach users

The legislation prevents unlicensed persons from assisting in the taking of fish for commercial purposes. This means that beach users who are observing beach hauling operations are not able to assist in hauling a net in toward the beach.

A clause has been incorporated in the ocean hauling code of conduct allowing for hauling crews working on beaches to have members of the public help unload the fish from a net that has been shot and retrieved. It specifically aims to allow families and children on the beaches to participate and help commercial fishers and improve social relations between user groups. It does not allow fishers to use unlicensed or unendorsed crew.

The wording of the clause was amended for the 2001/02 season following concern raised over endorsed ocean hauling fishers using unlicensed crew in operations under the pretence of this clause. It now reads:

"*Endorsed ocean hauling fishers may not allow any person to assist in any way in the operation of their nets unless they are a licensed commercial fisher holding an ocean hauling endorsement in the same region where the hauling operations are taking place. Other persons may assist in the removal of the fish from the net provided that they do not hold a commercial fishing licence*."

xiii) Size limits

Size limits apply to a number of important species taken in the Ocean Hauling Fishery. Size limits are designed to allow a sufficient proportion of the population to survive to maturity and thereby breed at a rate necessary to sustain the population in the long term.

The size limits for fish are prescribed in the Regulation and apply to both commercial and recreational fishers. Size limits that apply to the target or conditional target species in the Ocean Hauling Fishery are listed in Table B9.

Table B9. Minimum legal sizes of species that may be taken in the Ocean Hauling Fishery.

Species	Size limit - Total length (cm)
Sea mullet	30
Luderick	25
Bream (yellowfin or black)	25
Tailor*	30
Mulloway	45
Tarwhine	20
Sand whiting	27
Dusky flathead	36**
Sand flathead	33
Snapper	30***
Teraglin	38
School shark	91

* byproduct only

** increased from 33 cm on 1 July 2001

*** increased from 28 cm on 1 July 2001

xiv) Protected fish

The *Fisheries Management (General) Regulation 1995* identifies a number of species which are protected, either from commercial fishing or fishing by all sectors.

Fish protected from commercial fishing include:

Black, blue and striped marlin	Blue groper
Atlantic salmon	Silver perch
Australian bass	Brook, brown and rainbow trout
Eel-tailed catfish	Freshwater crayfish
Estuary perch	

Fish protected from all sectors include:

Ballina angelfish	Herbsts nurse shark
Eastern blue devil fish	Black rock cod
Elegant wrasse	Weedy sea dragon
Estuary cod	Australian grayling
Giant Queensland groper	Eastern freshwater cod
Great white shark	Trout cod
Grey nurse shark	Macquarie perch

xv) Catch limits or quotas

A daily bycatch limit applies to Australian salmon north of Barrenjoey Headland and to tailor in all NSW waters taken by commercial fishing nets as follows:

Commercial fishing activity	Daily possession limit per species
Hauling crew	100
Meshing crew (or individual)	50
Any other licensed commercial fishing vessel containing a commercial fishing net	50

xvi) Seafood safety programs

Food safety programs which relate to the Ocean Hauling Fishery are administered by SafeFood Production NSW under the *Food Act 1989*. Food safety programs for all commercial fisheries are currently being prepared by SafeFood Production NSW.

xvii) Provisions for unlicensed crew

Unlicensed crew can not currently be employed in the beach hauling [class A (skipper) and class B (crew)] sector of the fishery. A block licence concession was introduced in 1988 allowing boat-based ocean haulers to use unlicensed crew, whilst operating a garfish hauling net or a pilchard, anchovy and bait net from a boat. The concession was active until 16 January 1995, where upon the use of these nets required licensed commercial fishers.

The holder of a commercial fishing licence in the class C (purse seine) sector of the fishery may apply for an authorisation to employ unlicensed and unregistered crew or may employ a person who themselves are registered as crew. The authorisation is commonly referred to as a block licence.

An application for a crew registration may be refused if the applicant has been convicted of an offence referred to in the regulation. A licensed fisher employing crew must maintain records about their crew. Information relating to crew must be recorded on the catch return submitted each.

xviii) Special arrangements for skippers and crew

Special arrangements were provided to some operators when access to the Ocean Hauling Fishery was first restricted in 1995. The arrangements (often termed 'floating skippers') were created to accommodate a group of people who, because of the entry criteria, were unable to operate in their traditional team-based arrangements. This generally occurred with partnership and family-based operations where boats and gear were licensed and registered in one person's name, yet that equipment was normally operated by a number of ocean haulers who had traditionally operated together.

The arrangements allow for certain fishers who were only eligible for a class B (crew) endorsement to be authorised as if they hold a class A (skipper) endorsement. This arrangement only applies when the eligible class A (skipper) endorsement holder is not working as a skipper.

There are approximately 30 fishers subject to such special arrangements. The arrangements are transitional in nature and therefore lapse when a fishing business is sold.

xix) Training licences

Father and son fishing arrangements were introduced in 1988 as a variation to the licensing policy in place at the time to allow "sons" (or daughters) to enter the fishing industry under the direct supervision of their father.

"Sons" were required to operate under this arrangement for a five year period, similar to a traineeship or apprenticeship. During this period the sons were required to work on their father's licensed fishing boats and the father had to be present each time the son went fishing. Sons were also not entitled to submit their own monthly catch returns. Once the five year term was completed, sons were no longer restricted to their father's boats, were not required to be supervised by the father and the requirements for catch reporting commenced.

Father and son arrangements were replaced in 1995 by clause 135 of the *Fisheries Management (General) Regulation 1995* which provides for trainer and trainee fishing licences. In 1995, sons who had worked with their fathers in the Ocean Hauling Fishery had the opportunity to apply for an entitlement in the fishery.

Due to their operations as part of the crew, many of the sons met the eligibility criteria for a class B (crew) endorsement in the fishery. Without ownership of gear and net registrations and the restriction on entering catch returns within their first five years of fishing, however, sons were unable to meet the criteria for a class A (skipper) endorsement.

A son who has continued in the industry to this date can maintain his/her ocean hauling endorsement separately to his/her father's fishing business but, like all other ocean hauling fishers, the availability of the endorsement to a new owner upon transfer is subject to the relevant transfer criteria.

Licences are now available to eligible persons for the purposes of training a new entrant to the commercial fishing industry. There are two types of training licence currently available:

Trainer's licence: The seller may apply to continue to hold his/her fishing licence for up to one year from the next fishing renewal date, to work with the purchaser of the fishing business for training purposes (but the business must qualify as a RFO), subject to the entitlements of the fishing business, on the understanding that the licence is surrendered at the end of the one year period unless a further RFO is acquired which is not the original business.

Trainee licence: Within six months of acquiring a RFO a new entrant may request that the RFO be placed into abeyance whilst the owner works with an experienced fisher to gain the necessary skills. This arrangement may apply for a period of up to two years. Fishing methods which the new entrant can use are restricted to the entitlements held by his or her fishing business. Areas that can be worked by the new entrant are limited to areas included in the purchased RFO and areas of historic operation of the experienced fisher.

c) Administration

i) Renewal of licences and permits

At present commercial fishing licences and fishing boat licences must be renewed annually. Fishers are sent renewal application forms approximately one month before the expiry date on the licence. If a commercial fishing licence is not renewed within 60 days of the expiry date on the licence, the renewal application is generally taken to be an application for a new licence. Additional fees apply to late renewal applications (see below).

Abeyance period for fishing boat licences

Fishing boat licences can be held in abeyance for a period of up to two years from the date of expiry of the licence. Owners may also provide written advice that a boat licence is to be placed in abeyance. Fishing boat licence fees are not payable during the period of abeyance, but the full amount due is payable if the licence is reinstated within the two years specified.

ii) Fees

A number of fees are payable in the Ocean Hauling Fishery. An outline of the cost recovery policy and a summary of the fees follows.

Cost recovery policy

NSW Fisheries recoups costs that are attributable to industry through a cost recovery policy. The cost recovery policy applies to existing services traditionally provided by NSW Fisheries in administering and regulating commercial fishing.

In November 2000, the Government announced a new cost recovery policy. As part of the second reading speech for the *Fisheries Management and Environmental Assessment Legislation Amendment Act 2000*, the Minister for Fisheries, the Hon. Eddie Obeid, gave the following commitment for the fisheries that were moving to category 2 share management fisheries:

"Over the next five years the Government will develop and implement a cost recovery framework for category 2 share management fisheries. This framework will be subject to extensive industry consultation."

"During this period, the total amount of money collected for NSW Fisheries, for its existing management services, will not increase without the support of the relevant management advisory committee."

"After five years, the costs that have been identified as attributable to the industry will be progressively introduced over a further three-year period."

Commercial fishing licences

The following fees are payable on application for issue or renewal of a licence:

New licence application	
Fee	$416
Contribution to industry costs	$208
FRDC research levy	$115
Unlicensed crew application	
Fee per crew member	$52
Licence renewal received within 30 days of expiry	
Fee	$208
Contribution to industry costs	$208
FRDC research levy	$115
Unlicensed crew (class C and D only)	$52
Licence renewal received more than 30 days after expiry	
Fee	$312
Contribution to industry costs	$208
FRDC research levy	$115

Fishing boat licences

The following fees are payable on application for renewal of a fishing boat licence:

Renewal application lodged within 30 days after licence expiry:

Boats not greater than 3 metres in length $42

Boats in excess of 3 metres in length according to the scale hereunder:

Boats over 3 metres but not over 4 metres $63

Boats over 4 metres but not over 5 metres $84

Boats over 5 metres but not over 6 metres $105

Boats over 6 metres but not over 7 metres $126

Boats over 7 metres but not over 8 metres $147

Boats over 8 metres but not over 9 metres $168

etc… for each additional metre or part thereof, add an additional $21

Renewal application received over 30 days after licence expiry:

Boats not greater than 3 metres in length $145

Boats in excess of 3 metres in length according to the scale hereunder:

Boats over 3 metres but not over 4 metres $166

Boats over 4 metres but not over 5 metres $187

Boats over 5 metres but not over 6 metres $208

Boats over 6 metres but not over 7 metres $229

Boats over 7 metres but not over 8 metres $250

Boats over 8 metres but not over 9 metres $271

etc… for each additional metre or part thereof, add an additional $21

The fee to replace an existing licensed boat with a new boat is approximately $104, plus the cost of the new boat licence fee, which depends on the length of the boat.

Net registration

Net registration certificates are issued at local NSW Fisheries Offices. The fee for replacement of an existing net registration is $21.

Share management fishery rental charge

The FM Act provides that a rental charge of $100 applies to shareholders in a category 2 share management fishery (irrespective of the number or type of shares held). This charge applied from the commencement of category 2 share management fisheries on 23 March 2001.

Environmental impact assessment charges

Arrangements have been made under Part 5 of the *Environmental Planning and Assessment Act 1979* for recovery of the costs associated with the preparation of the Environmental Impact Statement (EIS). The EIS charge is payable annually for three years commencing from 1 July 2001. There is a charge of $150 for the first two fisheries in which the person is eligible to hold shares and $100 for each fishery thereafter.

A charge of $80 is also payable to contribute to the costs incurred in arranging for the Fisheries Resource Conservation and Assessment Council (FRCAC) to perform its functions in relation to the EIS, commencing from 1 July 2001.

Fishers have the option of paying these charges and the share management fishery rental charge in one or in four instalments over the course of each year.

Research levy

The annual fee of $115 is collected upon commercial fishing licence renewal and paid directly to the Fisheries Research and Development Corporation (FRDC) to support funding of fisheries related research programs around Australia. The FRDC support a number of research programs

relating to the Ocean Hauling Fishery in NSW. Further details on these programs can be found in section 5(d).

Endorsement application fees

The ocean hauling endorsement application fee is paid on an annual basis for fishers to maintain their ocean hauling endorsements. Generally, when the annual fee is not paid, the endorsement will not be allocated to the business for the new ocean hauling season.

Annual fee for a class A (skipper) endorsement	$260
Annual fee for a class B (crew) endorsement	$52
Annual fee for a class C (purse seine) endorsement	$260

A maximum fee of $291 applies to those fishers with both class A and class C endorsements.

Other transaction fees

There are several other fees payable in the fishery to cover the costs of individual licensing transactions, however, these only apply to the persons utilising these services. An example of this type of fee is the $260 fee payable for the transfer of a fishing boat licence.

iii) Appeals mechanisms

Fishers may lodge an appeal to the Administrative Decisions Tribunal (ADT) against a decision to refuse to issue or renew, suspend, cancel or place conditions on a commercial fishing licence (or an endorsement on that licence) or a fishing boat licence.

The main role of the ADT is to review administrative decisions of NSW government agencies. To lodge an appeal with the ADT, a request must first be made to NSW Fisheries for an internal review of the decision, then a written application should be lodged with the ADT no more than 28 days after the internal review was finalised.

The ADT can make various orders concerning an appeal application including:

- upholding the original decision
- reversing the decision completely or in part
- substituting a new decision for the original decision
- ordering the agency to reconsider the decision in light of the ruling.

For further information, refer to the *Administrative Decisions Tribunal Act 1997* or the following website: http://www.lawlink.NSW.gov.au/

d) Research

Table B10 provides a brief description of the primary research programs being conducted at present by NSW Fisheries that relate to the Ocean Hauling Fishery. This is not a comprehensive list of all research relevant to the fishery, as many other research groups and universities conduct programs that provide valuable information for use in fisheries management. Table B11 lists priority areas for research previously identified by the Ocean Hauling MAC and NSW Fisheries.

It is useful to separate the various research needs and projects into categories or types of research. Such classifications are never completely discrete and many research projects will have

aspects of several of the categories. The broad groupings that will be used to describe types of research proposed or under way for the fishery are as follows:

1) Fishery specific research. This would include for example, biological studies on target species, stock assessment modelling, tests of new fishing gear or handling methods.

2) Research relating to the fishery and its relationship with the general environment.

3) Monitoring (e.g. composition of landings, recreational harvest estimates, validation of catch returns).

The FMS deals with research done specifically on the fishery or on species of importance to the fishery (see Table B10). However, there are also a number of projects under way and areas of research activity that may be of indirect benefit to the Ocean Hauling Fishery. These include studies on recolonisation of seagrass in disturbed areas and on the influence of fish barriers in acid sulphate soil catchments on fish recruitment (see www.fisheries.nsw.gov.au for more information).

e) Catch monitoring

Records of commercial catch have been collected in NSW for over 50 years. The forms used by fishers to record catches have changed several times over the years (Pease and Grinberg, 1995), and most recently in July 1997. The information collected on commercial landings assists in the ongoing monitoring and assessment of the status of fish stocks.

Fishers in the Ocean Hauling Fishery are required to submit records on a monthly basis detailing their catch and fishing effort. The information includes total landed catch for each species, the effort expended (for each method) to take the catch (i.e. days fished), and the area/s fished. This information is entered onto a database by NSW Fisheries and allows for analysis of fishing activity, catch levels and effort levels.

A number of quality control procedures are in place and attempt to maximise data quality and reliability of the information provided on catch returns. It is, however, inevitable that the accuracy of data supplied by fishers cannot be directly assessed and can sometimes be variable, particularly with respect to fishing effort. Consequently, the commercial catch statistics supplied by fishers and maintained in the commercial catch records database is most accurately described as representing "reported landed catch".

Table B10. Research programs underway by NSW Fisheries relating to the Ocean Hauling Fishery. Categories relate to general research types described in section 5(d) of this Chapter.

Category	Project Title	Funding	Project Objectives
1	Stock assessment of yellowfin bream in NSW	This project is funded by NSW Fisheries and is ongoing	• Assess the size composition of estuarine and ocean commercial catches of yellowfin bream in NSW
			• Derive an age composition of the commercially harvested bream stock in NSW
			• Develop a conceptual model and a preliminary simulation model of the bream stock in NSW
			• Assess catch and effort trends from available data
3	Monitoring of yellowtail scad	This project is funded by NSW Fisheries and is ongoing	• To monitor annual age and length structure of commercial yellowtail landings by representative sampling of NSW purse seine catches
			• To analyse annual catch and effort statistics from NSW yellowtail fishers
			• To review reporting of catch and effort by NSW purse seine fishers, and recommend changes where appropriate
1,2	Fishery and biology of sea garfish	This project is funded by FRDC, UOW and NSW Fisheries. It commenced in December 2001 to continue for a period of 2.5 years	• To provide new information on the biology and life history of garfish species in NSW waters, particularly the two dominant species eastern sea garfish and river garfish, including: reproductive biology, time of spawning, age at maturity, initial estimates of growth rate, key habitat requirements, particularly the role of seagrasses and other vegetated areas as juvenile nursery areas and as feeding and spawning sites for adults
			• To provide the research basis for a future stock assessment of eastern sea and river garfish in NSW waters, including: a validated aging technique, estimates of size, age structure and reproductive state of landed catches for both species, and, initial assessment of environmental impacts of the fishery and possible impacts on the fishery
			• To provide advice to the fishing industry, fishers and NSW Fisheries on the management of the garfish fishery, including recommendations for research and monitoring, to assist in achieving a sustainable fishery in NSW waters
1	Mesh selectivity of garfish hauling nets	This project is funded by NSW Fisheries	• To determine the optimum mesh selectivity of garfish nets by comparing 25 mm mesh to 28 mm mesh
1	Stock assessment of sea mullet in NSW	This project is funded by NSW Fisheries and is ongoing	• To provide annual estimates of the size and age composition of sea mullet landings by the NSW Estuary General Fishery and Ocean Hauling Fishery
			• To complete annual analysis of catch and effort data from the NSW commercial sea mullet fisheries
			• To incorporate the biological and fishery data available for sea mullet into a dynamic population model which can be used to determine the requirements for the sustainable utilisation of the resource
3	Monitoring of selected commercial finfish species	This project is funded by NSW Fisheries and is ongoing	• Monitor the size composition of selected commercial finfish including blue mackerel, mulloway, sweep, sand whiting and silver trevally and store data in an accessible database
1	Age, growth and reproduction of sea mullet	This project is funded by NSW Fisheries and is due to complete in December 2003	• To validate and document ageing methods for sea mullet
			• Describe growth patterns of male and female sea mullet within NSW waters
			• To describe the spawning period and estimate fecundity for northern, central and southern NSW regions

Table B11. Priority areas for research from the Ocean Hauling MAC and NSW Fisheries.

Research Area
Analysis of annual catch / effort data for primary and secondary species in the Ocean Hauling Fishery
Improve catch / effort reporting by fishery and develop daily logbook system in the fishery
Examine biology and fisheries of sea, river and snub-nosed garfish
Describe sea mullet fecundity, egg diameter and timing of spawning cycle
Develop indices of sea mullet stock abundance and spawning biomass
Sweep biology and its fishery
Monitor size and age composition of high priority species in the fishery
Observer program on the Ocean Hauling Fishery including bycatch and species composition of
Biology and recruitment of bait fish / small pelagic fish
Effects of haul nets on habitat including seagrass
A desktop study on trophic relationships
The collection of anecdotal historical stock structure of yellowtail
Recruitment and biology studies for bream, yellowtail kingfish and yellowfin tuna
The predatory impacts of Australian salmon on other species

f) Compliance

There is a very high level of compliance by fishers in the Ocean Hauling Fishery. During the period from 1 July 1999 to 30 June 2000, 879 inspections of ocean hauling fishers or fishing gear were conducted, with a 98.75% rate of compliance.

NSW Fisheries has approximately 90 fisheries officers responsible for coordinating and implementing compliance strategies in NSW. These strategies include:

- maximising voluntary compliance
- providing effective deterrence for offences
- providing effective support services.

Approximately 65 of these fisheries officers are located in areas along the NSW coast in which the Ocean Hauling Fishery occurs. Their general duties include conducting patrols, inspecting commercial fishers and fishing gear, and recording rates of compliance.

Effective implementation of any fisheries management regime requires a compliance framework that leads to optimal levels of compliance within that management regime. According to the Strategic Direction for Australian Fisheries Compliance and Framework for Fisheries Agencies developed by fisheries agencies throughout Australia in 1999, an optimal level of compliance is defined as;

> *'that which holds the level of non-compliance at an acceptable level, which can be maintained at a reasonable cost for enforcement services while not compromising the integrity and sustainability of the resource.'*

NSW Fisheries manages compliance service delivery for each significant fishing or target program through a district compliance planning process administered within the Fisheries Services Division. Each district fisheries office is responsible for compliance service delivery within a geographical area, and develops a district plan based on the particular priorities associated with that area. These priorities vary throughout the state, may be determined by a focus of certain fishing

activities in that area, and may also be driven by the existence of areas of importance, or sensitive habitat within that area.

The district plan for the location sets out the percentage of available time officers from that office will spend on particular compliance duties. All coastal fisheries offices in NSW focus a set number of resources toward achieving optimal levels of compliance in the Ocean Hauling Fishery through their business plans. Other target service areas, including the recreational fishery, related commercial fisheries and the patrolling of fishing closures whilst carrying out routine duties, all provide indirect compliance benefits for the fishery.

The *Fisheries Management Act 1994* and the *Fisheries Management (General) Regulation 1995* provide a number of offences relating to fishing activities that encompass the methods used, and species taken in the Ocean Hauling Fishery. These offences and the maximum penalties are summarised in Table B12. The table is not a comprehensive list of offences under the Act or its regulations, but highlights the offences that are most relevant in the Ocean Hauling Fishery.

The Regulation lists a number of forfeiture offences for the seizure of boats and motor vehicles. A court may order the forfeiture of these items if it is satisfied that they were used to commit a forfeiture offence.

Forfeiture offences can include the following examples:

- Offences under the *Fisheries Management Act 1994*:

Section 8	Waters closed to fishing
Section 17	Bag limits – taking of fish – (recreational fishers)
Section 18	Bag limits – possession of fish – (recreational fishers)
Section 24	Lawful use of nets or traps
Section 25	Possession of illegal fishing gear
Section 247	Obstructing / impersonating a fisheries officer

- Offences under the *Fisheries Management (General) Regulation 1995*:

Clause 111	Use of explosive substances
Clause 113	Use of electrical devices

- An offence against the *Fisheries Management (Aquatic Reserves) Regulations 1995.*

Table B12. Current offences under the *Fisheries Management Act 1994* specifically relevant to the Ocean Hauling Fishery.

Please note that these offences and penalties are the current offences and penalties under the FM Act and its Regulation (as at April 2001), and apply to both commercial and recreational fishers

Section	Short title	Maximum penalty
14(1)	Take fish contrary to fishing closure	$22,000 and/or 6 months imprisonment
14(2)	Possess fish taken contrary to fishing closure	$11,000 and/or 3 months imprisonment
16(1)	Possess prohibited size fish	$11,000 and/or 3 months imprisonment
16(2)	Sell prohibited size fish	$11,000 and/or 3 months imprisonment
19(2)	Take protected fish	$11,000 and/or 3 months imprisonment
19(3)	Possess protected fish	$11,000 and/or 3 months imprisonment
20(2)	Take commercially protected fish for sale	$11,000 and/or 3 months imprisonment
20(3)	Sell commercially protected fish	$11,000 and/or 3 months imprisonment
22(2)	Use unregistered fishing gear	$2,750
24(1)	Unlawful use of net or trap	$22,000 and/or 6 months imprisonment
25(1)	Possess fishing gear in / on / adjacent to closed waters when use of that gear or taking of fish is prohibited	$22,000 and/or 6 months imprisonment
35(1)	Possess fish illegally taken	$11,000 and/or 3 months imprisonment
102(1)	Take fish for sale when unlicensed	$11,000
104(7)	Contravene condition of a commercial fishing licence	$11,000
107(1)	Use unlicensed boat to take fish / land fish for sale	$11,000
108(7)	Contravene condition of boat licence	$11,000
110(9)	Carry unregistered crew	$5,500
121	Fail to make catch record	$22,000
122	Fail to send catch record to Director	$1,100
219(1)	Obstruct fish in bay / inlet / river / creek / flat	$11,000
247(1)	Resist or obstruct a fisheries officer	$22,000 and/or 6 months imprisonment
248(4)	Fail to assist in boarding and search of boat	$5,500
249(3)	Fail to comply with requirement to remove gear from water	$5,500
256(4)	Fail to comply with requirement to produce records or answer questions	$5,500
257(4)	Fail to comply with requirement to produce authority	$2,750

g) Consultation

There are a range of consultative bodies established in NSW to assist and advise the Minister for Fisheries and NSW Fisheries on fisheries issues. There are committees that are established to provide advice on specific issues as well as bodies that advise on matters which cut across different fisheries or fishing sectors.

i) Management advisory committees

Share management and restricted fisheries in NSW each have a management advisory committee that provides advice to the Minister for Fisheries on:

- the preparation of any management plan or regulations for the fishery
- monitoring whether the objectives of the management plan or those regulations are being attained
- reviews in connection with any new management plan or regulation
- any other matter relating to the fishery.

Table B13 details the membership on the Ocean Hauling MAC. The industry members of the MAC comprise representatives that are elected by endorsement holders in the fishery. There is an industry representative from each of the seven coastal regions in the fishery. The members hold office for a term of three years, however, the terms of office are staggered and the terms of half of the industry members expire every 18 months.

The non-industry members on the MAC are appointed by the Minister for Fisheries and also hold terms of office for up to three years. To ensure that all issues discussed by the committee are fairly represented, the MAC is chaired by a person who is not engaged in the administration of the FM Act and is not engaged in commercial fishing.

Although the MAC receives advice from NSW Fisheries observers on research, compliance and administrative issues relating to the fishery, only members of the MAC have voting rights on the decisions of the MAC.

Table B13. Membership on the Ocean Hauling MAC.

Position	Northern boundary	Southern boundary
Independent chairperson	-	-
Region 1 – Upper north coast	NSW / Queensland border	29°15'S Jerusalem Creek – south of Evans Head in the Bundjalung National Park
Region 2 – Clarence	29°15'S	29°45'S Sandon River – south of Yamba in the Yuraqir National Park
Region 3 – North coast	29°45'S	31°44'S Diamond Head – south of Camden Haven in Crowdy Bay National Park
Region 4 – Central	31°44'S	33°25'S Wamberal Point – the entrance to Wamberal Lagoon north of Terrigal
Region 5 – Metropolitan	33°25'S	34°20'S Bulli Point at Bulli
Region 6 – Upper south coast	34°20'S	35°25'S Lagoon Head, Burrill Lake south of Ulladulla
Region 7 – Lower south coast	35°25'S	NSW / Victorian border
Recreational fishing	All areas	
Indigenous fishing	All areas	
Conservation	All areas	
NSW Fisheries	All areas	

ii) Ministerial advisory councils

Four Ministerial advisory councils are currently established under the *Fisheries Management Act 1994*. The Councils provide advice on matters referred to them by the Minister for Fisheries, or on any other matters the Councils consider relevant. They report directly to the Minister for Fisheries.

The Ministerial advisory councils currently established are;

- Advisory Council on Commercial Fishing (ACCF)
- Advisory Council on Recreational Fishing (ACoRF)
- Advisory Council on Fisheries Conservation (ACFC)
- Advisory Council on Aquaculture (ACoA)

The Ocean Hauling Fishery and each of the other major share management and restricted fisheries have representatives on the ACCF. These representatives are nominated by each of the respective management advisory committees and appointed by the Minister for Fisheries.

Representatives from the commercial fishing industry in NSW, or people who in the opinion of the Minister for Fisheries have expertise in commercial fishing, are also represented on the ACFC.

The name and composition of Ministerial advisory councils are determined by regulations under the FM Act, and may be altered from time to time.

iii) Fisheries Resource Conservation and Assessment Council

The Fisheries Resource Conservation and Assessment Council (FRCAC) has been established to play a key role in advising the Government on fisheries conservation and assessment throughout the State. The members on the council represent a wide range of interests and includes representatives from commercial fishing, recreational fishing, fish marketing, the fishing tackle industry, charter boat fishing, regional tourism, academic expertise, conservation, aquaculture and Indigenous peoples.

The FRCAC advises the Minister for Fisheries on the preparation and revision of fishery management strategies for fishing activities, including the draft FMS for the Ocean Hauling Fishery.

The legislative role of the FRCAC includes:

- the preparation or revision of a fishery management strategy (and for that purpose to review the environmental impact statement prepared in connection with the draft strategy)
- other matters as may be referred to it by the Minister for Fisheries.

In summary, the FRCAC duties involve:

- fostering relationships between community groups, recreational fishing interests, commercial fishing interests and government agencies
- advising on the preparation and revision of fishery management strategies
- reviewing environmental impact statements prepared in connection with draft strategies
- providing an opportunity for key stakeholder groups to have input into issues papers prepared for recreational fishing areas selection processes
- reviewing community consultation reports that arise from the recreational fishing area selection process.

Both the FRCAC and the Ministerial ACCF are consultative bodies that facilitate cross-sectoral and cross-fishery consultation, respectively.

6. Interaction with Other Fisheries and the Environment

a) Dealing with the relationships between fisheries

The fisheries of NSW are intrinsically complex due to the large diversity of species occurring and the wide range of areas fished and gear types used. Many species taken in the Ocean Hauling Fishery are also taken in other commercial fisheries, some species may be taken by other sector groups such as recreational and charter boat fisheries, and by fisheries managed under the jurisdiction of the Commonwealth or other States.

To avoid over-exploitation of fish stocks targeted by the Ocean Hauling Fishery, it is necessary to consider all potential sources of mortality. For this reason, fisheries science aims to develop stock assessments for individual species rather than just fishery-based assessments. Studies on the general environment and fishing activities are also underway to ensure that the Government's responsibilities to conserve biodiversity and ecological processes are met.

Results from stock assessment studies provide the information needed to put in place appropriate controls on the capture of particular species. Some of these controls, such as minimum legal lengths, apply to more than one user group. Similarly, the management objectives developed for species taken in several fisheries will need to apply to each of those fisheries and user groups.

The linkages between fisheries come into play during the development of the fishery management strategy for each fishery, and also in any subsequent reviews of strategies. If a fishery management strategy needs reviewing because there are concerns that the goals are not being met, the review may require the involvement of stakeholders in other fisheries or sectors. It may be that the problem was not caused by the operation of the fishery in question, but is due to the influence of some other activity or event.

As discussed in the preceding section the *Fisheries Management Act 1994* establishes a system of advisory councils who can advise the Minister for Fisheries on issues that cross different commercial fisheries within NSW. It is through the advice of these councils (e.g. the ACCF) that the Department can appropriately manage among fisheries. The same sorts of structures do not always exist where management issues cross jurisdictions (e.g. across State borders).

b) Interaction with other fisheries

i) Species interactions

A number of the species taken in the Ocean Hauling Fishery are important in other commercial and recreational fisheries. Sea mullet are also an important part of the Estuary General Fishery and Queensland mullet fishery. Australian salmon is also taken in the Victorian bays and inlets fishery. Most of the species that are part of the beach hauling sector, other than sea mullet, are caught by recreational anglers. The yellowtail and blue mackerel that are targeted in purse seine operations are used for bait in recreational fishing, in the Ocean Trap and Line Fishery and by Commonwealth tuna fishers.

ii) Other NSW commercial fisheries

There are 404 fishers (as opposed to 374 fishing businesses) with at least one entitlement to fish in the Ocean Hauling Fishery. Of these, more than 92% have entitlements in other fisheries. Ocean hauling fishers most commonly have entitlements to fish in the Estuary General Fishery (311, or 79%) and then the Ocean Trap and Line Fishery (171 or 43%).

The actual participation in the Ocean Hauling Fishery is more difficult to describe because of the way hauling crews are able to report their activities under a single skipper. It is likely then, that true participation is greater than just those fishers with catch assigned to their returns. Participation in the Ocean Hauling Fishery is marginally greater than in other fisheries, with 277 and 225 fishers reporting catch in 1997/98 and 1998/99, respectively. There were 300 individuals who recorded catch in one or other of the two years and of these 300, 256 reported catch in other fisheries. Those fishers reporting catch in fisheries in addition to ocean hauling most commonly reported from one other fishery (145 fishers) or two other fisheries (100 fishers).

Of the fishers who participated in the Ocean Hauling Fishery:

- 14% participated in the Ocean Hauling Fishery only
- 49% participated in 2 fisheries
- 34% participated in 3 fisheries
- 3% participated in 4 or more fisheries.

Participation mirrored entitlements and was most common in the Estuary General Fishery (71%) and in the Ocean Trap and Line Fishery (45%).

The Rock Lobster Fishery uses a number of ocean hauling target fish species as bait in inshore lobster traps. These fish baits are usually fresh, frozen or salted, and may compromise whole or part fish. Sea mullet and luderick are commonly used as bait in the Rock Lobster Fishery and some of these are supplied by both the Estuary General Fishery and the Ocean Hauling Fishery.

There is no overlap of species taken in this fishery with the Inland Restricted Fishery or the Abalone Fishery and Rock Lobster Fishery. Abalone and rock lobsters are only permitted to be taken commercially by fishers endorsed in those fisheries.

Appendix B1 details the ratio of catch recorded among commercial fisheries in NSW for the prominent species in the Ocean Hauling Fishery.

iii) Commercial fisheries in other jurisdictions

Many of the target species from the Ocean Hauling Fishery are also taken in the coastal fisheries managed by Queensland, Victoria and the Commonwealth. Estimates of recent landings from those adjacent State fisheries are shown in Table B14.

Offshore Constitutional Settlement

Offshore Constitutional Settlements (OCS) involve an exchange in power between the States and the Commonwealth over marine and seabed resources. These settlements aim to provide a framework for more ecologically rational management of fish populations and simplification of administration and licensing for fishers.

An OCS was reached between NSW and the Commonwealth in 1991 that defines jurisdiction over specific fisheries by area, species and gear type. This OCS is binding and covers waters outside 3 nm. The Commonwealth retain jurisdiction over tuna and billfish species by the main commercial methods in all waters outside 3 nm. The Commonwealth also has jurisdiction over the 16 major trawl species when taken by the methods of fish trawling south of Barrenjoey Headland only. The Commonwealth Small Pelagic Fishery (SPF, formerly the Jack Mackerel Fishery) also extends outward from 3 nm.

Since the signing of this agreement, negotiations have continued between the Commonwealth and NSW in an attempt to further simplify the agreement and meet fishers' requirements and expectations.

The Commonwealth Tuna Fishery

Commonwealth tuna longliners and polers interact with the Ocean Hauling Fishery (and NSW recreational and charter fisheries) when collecting bait. Bait collection is limited to yellowtail scad, blue mackerel and pilchards. Collection is under permit or licence condition and the bait may not be sold and must be used for tuna fishing.

The Commonwealth Small Pelagic Fishery

The SPF includes the use of purse seine and mid-water trawl nets in Commonwealth waters and is managed by the Australian Fisheries Management Authority (AFMA). There is currently very little information available on any of the catches taken in the SPF and particularly the impact of this fishery on the NSW Ocean Hauling Fishery.

Small pelagic species currently under Commonwealth jurisdiction in the SPF include jack mackerel (*Trachurus declivis*), Peruvian jack mackerel (*T. murphyi*), yellowtail (*T. novaezelandiae*), blue mackerel (*Scomber australasicus*) and redbait (*Emmelichthys nitidus*). Catches in the SPF are not identified by species and the most recent reported catch from the entire SPF was 3,790 tonnes (www.afma.gov.au /default.htm).

The Commonwealth South East Non-Trawl Fishery

There is very little overlap between most of the South East Non-Trawl Fishery (SENTF) and the NSW Ocean Hauling Fishery. There are, however, a number of purse seine endorsements in that fishery that have access to the same species as the SPF adjacent to NSW waters.

Table B14 reports landings in tonnes from NSW, Victorian and Queensland fisheries of ocean hauling target species for the periods indicated. No reports are available from Commonwealth fisheries for these species. Reports from Queensland only include species with total landings over 20 tonnes. Some species are not reported similarly in some states (e.g. NSW combines yellowfin and black bream).

Table B14. Estimates of recent landings of ocean hauling species taken in other jurisdictions.

* Bait taken by Commonwealth tuna fishery in NSW waters.

Ocean Hauling Target Species	NSW 1998/9 (tonnes)	Victoria 1997/8 (tonnes)	Queensland 1996 (tonnes)	Commonwealth
Anchovy	2	326		
Australian salmon	160	708		
Blue mackerel	356			SPF, SENTF, Bait
Bonito	263			
Dart	9		29	
Sea garfish	78	91		
Jack mackerel	15	6		SPF, SENTF, Bait
Luderick	470	51		
Pilchard	194	791	52	SPF, SENTF, Bait
Sand whiting	165			
Sandy sprat	39			
Sea mullet	2905	14	1704	
Sweep	81			
Yellowfin bream	343		138	
Yellowtail	442			SPF, SENTF, Bait

iv) Recreational fisheries

Conflict between the commercial sector and recreational sector has resulted in substantial changes to the Ocean Hauling Fishery through time. A number of the closures with respect to commercial hauling on ocean beaches and some ocean waters have been introduced to resolve long standing conflict issues. Similarly, introduction of a zoning scheme in 1995 significantly contributed to reducing conflict between commercial and recreational fishing sectors, by reducing the number of commercial ocean hauling teams travelling along the length of the NSW coast.

The relationships between the Ocean Hauling Fishery and the recreational fishery arise in two main areas. Recreational fishers are active on all ocean beaches and apart from sea mullet, there is considerable overlap in species caught (Steffe *et al.,* 1996a). Many of the species targeted by the purse seine fishery are also popular with recreational fishers, both as bait (e.g. yellowtail and blue mackerel) and for consumption (e.g. sweep).

No overall estimate of the landings of the recreational fishery is available, but Steffe *et al.* (1996a) found the catch on beaches of yellowfin bream and tailor were considerable and in excess of commercial catches in the northern region of NSW. Similarly, Steffe *et al.* (1996b) showed that bait species were landed in significant quantities.

Steffe *et al.* (1996a) completed a survey which focused on the recreational use of fisheries resources in coastal areas of northern NSW. They found that significant recreational harvest came from fishing on coastal beaches, rocky headlands and breakwalls. A feature of the recreational harvests estimated by Steffe *et al.* (1996a) was that relatively few species accounted for the bulk of the harvest, even though a diverse range of species was kept by anglers. Eight of the most abundantly harvested species included yellowfin bream, swallowtail dart, sand whiting, tailor, sea garfish, luderick, silver trevally and dusky flathead. Many of these species are prominent in the Ocean Hauling Fishery, however, the most important ocean hauling species, sea mullet, was not taken by anglers in ocean waters during the study.

In a separate study, Steffe *et al.* (1996b) provided estimates of the recreational harvest and fishing effort for offshore fishing from trailer boats. That study reported that offshore boat-based recreational harvests of most species common in the Ocean Hauling Fishery are relatively low. Some exceptions were that many of the species targeted by purse seine fishing such as yellowtail, blue mackerel and silver sweep were also taken by recreational fishers. The study also reported significant effort, in excess of 200,000 trailer boat trips, in the offshore recreational fishery.

Recreational anglers often gather fish for bait with blue mackerel and yellowtail taken and retained in large quantities (Steffe *et al.,* 1996b). Retained bait at the end of fishing trips is obviously an underestimate of total bait harvest (Stewart *et al.,* 1998). This harvest has been estimated at game fishing tournaments and can be in the order of thousands of kilos over the duration of a tournament.

Conflict over grounds used for bait gathering by purse seine (and lift net) vessels and recreational fishers has been an occasional issue in a small number of areas along the NSW coast. The complaints generated from recreational fishers over this conflicting use of bait resources are directed at both NSW purse seine vessels and at Commonwealth tuna vessels.

The Government has recently initiated a program that will provide a mechanism for reducing much of the conflict between recreational and commercial fishers. Under the program, revenue from the new general recreational fishing licence will be used to create recreational fishing areas, and financial compensation will be paid to commercial fishers in exchange for their fishing entitlements.

c) Stakeholders

There are a significant number of stakeholders in the Ocean Hauling Fishery due to the large physical area covered by the fishery, the interactions between other fisheries, the number of species taken, and the fact that it operates along beaches and in ocean waters which are accessible, popular areas for recreation. Collectively, the stakeholders of this fishery are an important reserve of information about fishing practices and about the fish stocks. Effective communication with stakeholders can add to management and understanding of the fishery by being designed to take advantage of stakeholder knowledge.

i) Commercial fishers

The primary stakeholders in the Ocean Hauling Fishery are the owners of approximately 374 fishing businesses with one or more entitlements to operate in the fishery.

Commercial fishers clearly have the greatest direct stakeholding in the draft FMS as it will affect how they operate and, ultimately, the amount of income received from fishing. A well managed, sustainable fishery will provide ongoing financial benefits to commercial fishers, their families, and the community well into the future.

As noted earlier in this chapter, the level of participation within the fishery is diverse. Some fishers work full-time and solely in this particular fishery, while other licence holders have other employment and only fish during peak periods.

Ocean hauling fishers provide an important service to that part of the community who enjoy eating seafood but who are either not able or not willing to venture out and catch fish themselves. The fishery also harvests a number of species which are generally more affordable than some premium priced seafood products targeted in some of the other fisheries. Ocean hauling fishers also provide bait to recreational fishers.

ii) Recreational fishers

Recreational fishing is a very popular past-time in NSW. Preliminary data provided by the National Recreational and Indigenous Fishing Survey conducted in 2000 and 2001, indicated approximately 16% of the NSW population go recreational fishing at least once a year. This preliminary data also suggests that approximately 40% of these people fish in estuarine waters as opposed to 30% in ocean waters and 14% in freshwater rivers and streams. These preliminary figures appear to be consistent with levels of catch (by numbers) with 42% of total recreational catch coming from estuaries, 37% from ocean waters and 8% from freshwater rivers and streams.

The national survey plans to translate these number and percentage figures into estimated catch weights during the latter part of 2001 and early 2002.

Some studies conducted on recreational fishing activities in specific areas have concluded that the recreational catch of some species is equivalent to, or may exceed, the commercial catch (see West and Gordon, 1994). For further information please refer to the above section 6(b) of this chapter.

As stakeholders in the Ocean Hauling Fishery, the recreational fishing sector is represented on the key advisory body to the Government with respect to this fishery, the Ocean Hauling MAC. The recreational fishing representative on each commercial fishery management advisory committee has full voting power and equal participation to the commercial fishing, conservation, and Indigenous representatives.

iii) Indigenous people

Indigenous people are also stakeholders in the Ocean Hauling Fishery. There are Indigenous people who hold entitlements in the fishery. Indigenous people have also traditionally caught and continue to catch some of the target fish species in this fishery for consumption, trade or barter within their communities. There are also Aboriginal people who, while having no direct involvement with the fishery, have lodged Native Title claims that may impact on Ocean Hauling Fishery.

It is important for NSW Fisheries to work with Indigenous people to take collaborative approach to fisheries management.

NSW Fisheries is in the process of developing an Indigenous Fisheries Strategy which will lead to the development of a range of initiatives and programs to facilitate Indigenous fishing in NSW. The aim of the Indigenous Fisheries Strategy is to focus on:

- Indigenous people's interests in fisheries, including customary marine tenure and traditional fishing practices
- the extent of Indigenous people's involvement in management of fisheries and the marine environment
- impediments to Indigenous people's participation in commercial fisheries and mariculture operations
- the impact of commercial fishing on fishing for traditional purposes
- cultural awareness and improved relations between Indigenous peoples and other stakeholder groups.

The exact number of Aboriginal people directly involved in this fishery is not presently known. Similarly, there is no information on the number of Indigenous fishers who participate in

recreational fishing activities, however, such information is being collected as part of the National Recreational and Indigenous Fishing Survey.

In 1997, NSW Fisheries conducted a small survey on Aboriginal coastal fishing. The survey showed that Indigenous people fished regularly and that they often fished to feed large or extended families. When certain circumstances exist, the Minister for Fisheries may issue a permit under the *Fisheries Management Act 1994* that authorises Indigenous people to meet specific cultural obligations with respect to traditional fishing.

As stakeholders in the Ocean Hauling Fishery, the Indigenous people are represented on the Ocean Hauling MAC. The Indigenous fishing representative on each management advisory committee has full voting power and equal participation to the commercial fishing, conservation and recreational representatives.

iv) Conservationists

Conservation groups and individuals have a significant stakeholding in the resource harvested by the Ocean Hauling Fishery through their interest in ensuring the conservation and protection of natural resources and ecological systems.

The Nature Conservation Council of NSW (NCC) is the peak umbrella organisation for around 130 conservation and environment groups in NSW.

The goals of the NCC are to conserve the environment of NSW. Specifically, the Council aims to conserve and protect:

- the diversity of living plants and animals in NSW, especially rare and threatened species
- unique ecosystems in NSW, from the western arid lands to the eastern coastline
- the environmental quality of NSW land, air, waterways, and adjacent sea - and of the urban environment.

The conservationist interest in the Ocean Hauling Fishery may extend from concerns over threatened species, bycatch and the impact of the gear used on habitat, to simply knowing that the fishery is being managed in a manner that will ensure the conservation of marine resources for future generations. Conservationists place a significant value on non-consumptive uses of the resource.

As stakeholders in the Ocean Hauling Fishery, conservationists are represented on the Ocean Hauling MAC. The conservation representative on each management advisory committee has full voting power and equal participation to the commercial fishing, recreational and Indigenous representatives.

v) The community

The fisheries resources of NSW are owned by the community at large. The Minister for Fisheries is responsible for the legislation under which fisheries are managed and the development and implementation of government policy in relation to fisheries.

The community includes people with interests in one or more of the stakeholder groups discussed above. Other groups in the community having a significant stakeholding in the fishery, include all beach users, divers and tourism operators that come in contact with ocean hauling operations and the fish eating public. A considerable issue relating to all community stakeholders is promoting harmony and resource sharing.

Yearsley *et al.* (1999) notes that Australians are beginning to understand the health benefits of eating seafood and the fact that it is generally widely available and quick and easy to prepare. It is also estimated that 60% of the seafood consumed in Australia is imported from overseas, leaving 40% to be supplied from domestic fisheries.

It is important to acknowledge the demand generated by the broader community to access seafood products harvested by the commercial fishing industry.

vi) Fisher based organisations

There are a number of fishermen's co-operatives in NSW that provide services for fishers in this fishery. The major co-operatives are located at Ballina, Bermagui, Brunswick-Byron, Clarence River, Coffs Harbour, Crowdy Head, Evans Head, Hastings River, Hawkesbury River, Laurieton, Macleay River, Mannering Park, Newcastle, Taree, Twofold bay, Ulladulla, Wallis Lake, Wollongong and Wooli.

The co-operative system is not only important for fishers in terms of a way of distributing catch and selling fish taken in the fishery, but also provides a link for communication within industry, and between industry and other organisations including NSW Fisheries.

A number of other fisher based organisations exist in NSW including the Northern Professional Fishermen's Association, Master Fish Merchants Association, Metropolitan Fishermen's Association, Australian Seafood Industry Council, NSW Seafood Industry Council, Oceanwatch and Profish NSW.

vii) Markets

The *Fisheries Management Act 1994* places restrictions on the sale of fish. Fish taken by a commercial fisher when using a commercial fishing boat or commercial fishing gear are deemed by the Act to have been taken for sale.

Prior to 1999, commercial fishers were required to sell their catch through a recognised market, being either the Sydney Fish Market or a Fisherman's Co-operative trading society. In areas not serviced by a recognised market the fisher could sell the catch to a Certificate of Exemption (COE) holder, or direct to the public if the fisher held a consent under the Act. Consents were issued to fishers who were able to show they resided beyond a certain distance from a recognised market, or that the market did not cater for their product (e.g. for the sale of bait in local markets). The Sydney Fish Market, in addition to being an RFR, is the single most important market place for fish caught in NSW.

Under the regulated marketing system prior to 1999, there were 22 Fishermen's Co-operatives, 45 COE holders and 154 consent holders that serviced NSW. In November 1999, this marketing system was replaced by a deregulated system of fish receivers. Co-operatives and COE holders were granted Registered Fish Receiver (RFR) certificates and consent holders were granted Restricted Registered Fish Receiver (RRFR) certificates.

Under deregulation any person, commercial fisher, business or company may apply for a Fish Receiver certificate. These new registered fish receivers are now servicing areas that previously had no local market structure. New markets in the Shoalhaven and Hastings areas are examples of the success of the new deregulated regime.

The Ocean Hauling Fishery harvests a small number of species that are exported either whole or after processing. Accurate figures on the level of exports taken in this fishery are not currently available, however, the financial return on the export of eels and sea mullet roe is known to be significantly greater than the prices achieved on domestic markets.

d) Ecosystem and habitat management

This section provides only a brief overview of the description of ocean beaches, rocky headlands and offshore island habitats and their ecological importance as well as NSW coastal patterns. A comprehensive review of the habitat types important for the long term sustainability of the Ocean Hauling Fishery is included in Chapter F of this EIS.

i) Ocean beach habitats

The eastern Australian coastline is comprised of long barrier type beaches interrupted by rocky headlands and estuaries. The habitat profile is fairly consistent for all ocean beaches. These beaches are formed from marine sands and are dynamic in their structure. Prevailing winds, currents and climatic events are constantly sculpturing their profile. Common benthic inhabitants are beach worms, pipis and numerous isopods and amphipods. The structure of an ocean beach ranges from extensive sandflats, deep gutters to offshore sandbars. Inhabitants of these areas rely on sand erosion, caused by waves, to uncover their food source. Marine vegetation along the majority of these beaches is non-existent, however, extensive seagrass areas can be found on beaches classified as ocean beaches for the purpose of the beach haul fishery in Jervis Bay, Twofold Bay and Disaster Bay. There are also areas of seagrass on Broughton Island adjacent to beaches that may be used in ocean hauling.

The definition of ocean hauling beaches in the fishery includes some areas inside the usual 'ocean versus estuary waters' boundary that runs between headlands. This leads to the possibility that a very small proportion of traditional shots will cross sensitive estuarine habitats such as seagrass. An example of this occurs at Port Hacking on "Salmon Haul Beach" where the shot crosses *Posidonia* and *Zostera* seagrass beds.

ii) NSW coastal climate

The climate of south east Australia is primarily influenced by a mixture of mid latitude (frontal) and sub tropical (anti cyclonic) weather systems. Long-term variations (spanning several years; e.g. El Nino) due to major shifts in ocean temperatures and wind patterns across the tropical Pacific Ocean are also important.

Rainfall, though relatively high along the coast and nearby ranges, is notoriously variable. Coastal rainfall is enhanced by the prevalence of onshore winds for much of the year, the presence of the Great Dividing Range and by the relatively warm offshore ocean temperatures associated with the East Australian Current.

Rainfall is markedly seasonal on the north coast with most falling in the first six months of the year. In general, the overall amount of rainfall decreases from north to south, however, significant departures from this trend occur as a result of local topography. An example is the relatively high rainfall along the Illawarra escarpment south of Sydney.

In terms of temperature and humidity, coastal NSW is split between two climatic zones: "warm humid" in the north (from about Port Stephens) and "temperate" in the southern half

(Australian Bureau of Meteorology; www.bom.gov.au). Whilst temperature extremes are therefore rare, occasional winter frosts and summer heatwaves do occur, particularly away from the coast.

The issue of climate change is relevant to the Ocean Hauling Fishery, particularly in the medium to long term. Current projections suggest that globally average surface area temperatures will rise between 1 and 5.8 degrees Celsius by the year 2100 as compared with 1990 (Max-Planck-Institut fur Meteorologie; www.ipcc.org). Global mean sea level is likewise projected to rise by between 9 and 95 cm. Changes in rainfall patterns are also likely, with extreme events such as floods and droughts becoming more common.

iii) Access to ocean beaches

Many of the State's ocean beaches have become a focus for recreation and are attractive to a wide range of user-groups for reasons primarily relating to shelter, accessibility and scenery. The use of the four-wheel drive for recreational pastimes has seen once isolated ocean beaches become popular destinations. Areas that were once the domain of commercial beach fishers and small numbers of recreational fishers are now accessible to many. Pollution in the form of bait packaging, drink containers including glass bottles is increasing and is now becoming a serious issue for the agencies responsible for the management of ocean beaches.

Access to some of these beaches has now been restricted and many beaches now require a permit to allow access by four-wheel drive. These permit systems are mostly operated by local government agencies. In addition to local government restrictions many of the areas abutting ocean beaches have been declared National Parks or Nature Reserves. The declaration of these areas may alter the accessibility of ocean beaches by four-wheel drive.

iv) Ocean beach ecosystems

Common benthic inhabitants are beach worms (family Onuphidae), pipis (*Plebidonax* species) and a variety of amphipods including sand hoppers (*Talorchestia* species). The majority of fish captured on ocean sea beaches, with the exception of sea mullet, are jointly targeted by both the commercial and recreational sector. Tailor, Australian salmon, sand whiting, mulloway and yellowfin bream are all commonly caught on ocean beaches. Unfortunately, there is very little scientific data concerning the ecology of fish in these habitats (Kailola *et al.,* 1993).

v) Rocky headlands and offshore islands

Although rocky headlands are not seen as a primary beach hauling fishing ground they are a key component to the beach hauling fishery. Situated in most instances at the extremities of ocean beaches they act as a shelter or refuge zone for travelling fish and as a buffer against adverse weather conditions for commercial fishers. The headland normally provides a lee area from predominant weather conditions, allowing relatively calm waters for beach hauling operations.

For the boat-based commercial fisher targeting sea garfish, the headlands and offshore islands are the prime fishing areas. These areas are important recreational fishing and diving destinations.

In comparison to ocean beaches, rocky headlands and islands contain a greater diversity of marine life. Many different species of marine algae, soft and hard corals thrive in these areas. The coral substrata and algae beds provide a range of key habits, which in turn support invertebrates and fishes. Over 650 species of fish have been identified in rocky areas of southern Australia (Lincoln

Smith and Jones, 1995). Many of the resident species found in these areas are either herbivores or omnivores, which are heavily reliant on sub-tidal communities.

vi) Habitat management

The importance of maintaining healthy fish habitat in ensuring the long term sustainability of fish stocks is understood and well recognised.

Proper management of land-based catchment uses is essential to the long term survival of fish habitat and fish stocks. The *Fisheries Management Act 1994* provides for the protection of fish habitats. These provisions can be found in Part 7 of the Act, and the primary habitat related provisions of this part are:

Habitat protection plans - allow for the preparation and gazettal of management plans for the protection of specific aquatic habitats. NSW Fisheries has gazetted two plans under this provision. The first of these plans summarises various protective measures in the Act, but also protects 'snags' such as fallen trees and logs. The second plan deals specifically with the protection of seagrasses. A further plan for the Hawkesbury Nepean River system has recently been completed.

Aquatic reserves - allow for the creation and management of aquatic reserves.

Dredging and reclamation – allows for the control and regulation of dredging and reclamation activities which may be harmful to fish and fish habitats. It establishes requirements to obtain a permit from, or consult with NSW Fisheries.

Protection of mangroves and certain other marine vegetation – allows for the regulation of damage to, or removal of, certain marine vegetation. At this stage, mangroves, seagrasses and macroalgae (seaweed) are the only forms of marine vegetation protected in this way. A permit is required to remove or damage marine vegetation.

Noxious fish and noxious marine vegetation – allows for the declaration of undesirable fish and marine vegetation as noxious. Once declared noxious these fish or vegetation may be liable to be seized and destroyed.

Release or importation of fish – allows for the control of the release, import, sale or possession of fish not originating from NSW waters. The purpose of this provision is to prevent the spread of disease and the introduction of undesirable species. A permit is required to import fish into, or release fish in, NSW waters.

Miscellaneous (including fish passage) – provides for the free passage of fish past barriers such as dams and weirs. This facilitates the installation of fishways, and/or implementation of appropriate operational procedures for weirs.

Other legislation is in place, such as the *Environmental Planning and Assessment Act 1979*, to ensure that all environmental impacts are taken into account during the approval of new developments or alterations of existing developments. Development applications which have the potential to harm fish or fish habitat are referred to NSW Fisheries for comment or recommendations.

In 1999 NSW Fisheries published an updated version of *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation*. This document aims to improve the conservation and management of aquatic habitats in NSW and is targeted at local and State government authorities, proponents of developments and their advisers, and individuals and organisations concerned with

planning and management of aquatic resources, such organisations include those concerned with conservation.

There is a range of other whole-of-government programs underway to manage the environmental problems across catchments and to enable the consideration of flow-on effects from activities undertaken in an area. These include:

- Coastal Council of NSW
- total catchment management, involving catchment management boards
- water reform
- improving community access to natural resource information
- acid sulphate soils management.

vii) Marine protected areas

NSW is committed under international, national and state agreements to conserve marine biodiversity and manage the ecologically sustainable use of fish and marine vegetation. A key component of these strategies is to establish a system of marine protected areas that adequately represent the biodiversity found in the oceans and estuaries of Australia.

Marine protected areas can preserve many different types of marine environments, and the animals and plants that live in them. No-take areas within marine protected areas provide a refuge from fishing and should allow fish to breed and grow. They provide unspoilt natural sites for people to visit, and offer areas for education and research.

The NSW system comprises three distinct types of marine protected areas and these are discussed below. It is important to note that some marine protected areas allow for a range of activities to occur. The activities permitted depend on the particular area and may include the collection of bait, harvest of lobsters or abalone by hand and recreational angling.

Marine parks

Marine parks are areas of coastal, estuarine or oceanic waters and adjoining lands permanently set aside to protect the organisms including plant life, fish species, birds and other animals that live in that environment. Marine parks are managed to effectively conserve biodiversity and associated natural and cultural resources, while still allowing for the sustainable use and enjoyment of these areas by the community. The community has a vital role in the management of marine parks. Community input is provided at two levels – at the State-wide level through the Marine Parks Advisory Council, and at the local level through advisory committees established for each park.

Marine parks are the largest type of marine reserve in NSW. A range of marine protected areas has already been established in NSW, with more planned, in order to ensure that all types of ecosystems and habitats are protected.

The three marine parks that are already declared include:

- Solitary Islands
- Jervis Bay
- Lord Howe Island

Aquatic reserves

Aquatic reserves are administered by NSW Fisheries and play an important role in conserving biodiversity and protecting significant marine areas. Eight aquatic reserves have been declared in NSW, with the type of protection varying throughout the reserves. In some areas, diving and observing are the only activities permitted whilst in others, activities such as recreational angling are allowed.

The eight aquatic reserves already declared include:

- Julian Rocks off Byron Bay (approx. 10 hectares)
- Fly Point in Port Stephens (approx. 75 hectares)
- Long Reef, near Dee Why (approx. 60 hectares)
- North (Sydney) Harbour near Manly (approx. 75 hectares)
- Towra Point in Botany Bay (approx. 333 hectares)
- Shiprock, in Port Hacking (approx. 3 hectares)
- Cook Island off Tweed Heads (approx. 12 hectares)
- Bushrangers Bay south of Wollongong (approx. three hectares).

Cook Island was gazetted in 1998, however, the Regulation is yet to be amended. Further aquatic reserves are being proposed for each 'bioregion'. NSW is divided into five distinct bioregions and one marine province (Lord Howe Island Province). These subdivisions are based on the Interim Marine and Coastal Regionalisation for Australia (IMCRA), which used biological and physical characteristics to distinguish the various regions.

Intertidal Protected Areas

Intertidal Protected Areas (IPA) were created at 14 areas around Sydney in July 1993. They extend from mean high water to 10 metres seaward, beyond mean low water. The IPA around the Sydney area include:

Barrenjoey Headland	South of Bondi Beach
Bungan Head	Bronte south to Coogee
Mona Vale Headland	Long Bay
Narrabeen Head	La Perouse
Dee Why Head	Inscription Point
Shelly Beach	Boat Harbour
Sydney Harbour	Cabbage Tree Point

Intertidal Protected Areas prohibit the collection of invertebrates (except crayfish and abalone) from within those areas. These invertebrates include crabs, gastropods, cunjevoi, octopus, sea urchins, anemones, pipis, cockles, mussels, oysters and nippers (saltwater yabbies).

The 14 IPA outlined above have been chosen to preserve and protect the intertidal animals and habitat and act as reservoirs to assist in re-populating other areas. Recreational and commercial fishing is permitted in IPA, however, bait must not be gathered from within the designated areas.

Further IPA are being proposed for each bioregion and could include an extension of the protected area to 100 m seaward.

Marine or estuarine extensions of National Parks or Nature Reserves

There are currently 35 National Parks or nature reserves dedicated or reserved under the under the *National Parks and Wildlife Act 1974* that contain marine protected areas. These areas are administered by the NSW National Parks and Wildlife Service.

e) Hazard issues

There are a number of hazard issues affecting the use of ports or locations where ocean hauling fishers operate. There are two broad categories of hazard, those that are external to commercial fishing and those that relate to commercial fishing.

Hazard issues external to commercial fishing include the position of breakwalls, moorings in bays, other waterway craft such as speed boats, jet skis and other beach users in or around the surf zone. Other hazards may include turbulent waters in the surf zone, rocky headlands, rocks along beaches and sandbars.

Hazard issues related to commercial fishing include the times and locations that fishers shoot their nets during fishing operations. For instance, poor lighting at night increases the risk of boating accidents including possible collisions with other watercraft or objects, particularly in boat-based ocean hauling operations. Similarly, water currents and submerged hazards can result in fishing gear becoming entangled and may increase the risk of injury to the fisher operating the gear.

Boats used in this fishery may contain heavy equipment such as large amounts of net, or moving parts such as winches and small derricks. There is the potential of injury to fishers while operating these equipment types from boats or on the beach, or even by moving about on the relatively small boats which are used in beach hauling operations.

7. Outcomes of Review

The purpose of this chapter of the EIS is to present the outcomes of a review of the current operation of the Ocean Hauling Fishery into the key issues that need to be addressed in the draft FMS (Chapter C). A description of each of those issues appears below in the context of how the fishery currently operates. An outline of the changes in the fishery that are proposed by the draft FMS to address each issue can be found in section 3 of Chapter C.

a) Managing impact of the fishery on species and communities not targeted by the fishery

The concerns in this area arise from issues about bycatch and the impact on threatened and protected species. Neither of these issues are currently believed to be large problems in the Ocean Hauling Fishery, however, their importance is such that clear documentation is needed of the impact of the fishery on bycatch and threatened and protected species.

Both the Planning NSW environmental assessment guidelines and the Commonwealth's guidelines for ecological sustainability place a significant emphasis on properly managing bycatch problems in fisheries. It is not known if there are significant quantities of discarded bycatch in some ocean hauling activities.

Activities which impact on species or populations that are listed as being threatened must, under several sources of legislation, be modified or phased out so as to mitigate those impacts. Protected animals must also receive a higher conservation status. This includes threatened mammals, birds and reptiles, as well as fish species.

Similar to issues associated with non-target species, habitat issues associated with the Ocean Hauling Fishery are believed to be minimal. Such is the importance of the issue, however, that all fisheries will be asked to clearly demonstrate their impact on important habitats that are each fishery's responsibility. Both fishing and non-fishing activities must be considered here, including the use of vehicles approaching and driving along beaches in hauling activities.

b) Sustainability of target species

In the Ocean Hauling Fishery, sea garfish are thought to be overfished and the information on which to base decisions affecting the species is poor. In general, stock assessment information is at a very basic level for most of the species targeted in the fishery. The fishery currently has 82 endorsed skippers that may target sea garfish in their hauling operations. Each of these may also use any number of class B (crew) endorsements holders as team members in garfish hauling operations. Based on the limited information available, this is far more than the stock could sustain as active participants and far more than have traditionally targeted this species.

The Commonwealth has produced guidelines for assessing the ecologically sustainable management of fisheries under the *Environment Protection and Biodiversity Conservation Act 1999* which include the following requirements:

> ***"Objective 2**. Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes.*
>
> ***Management responses (required)***
>
> ***1.2.1** A precautionary recovery strategy is in place specifying management actions, or staged management responses, which are linked to reference points. The recovery strategy should apply until the stock recovers, and should aim for recovery within a specific time period appropriate to the biology of the stock.*
>
> ***1.2.2** If the stock is estimated as being at or below the biological and/or effort bottom line, management responses such as a zero targeted catch, temporary fishery closure or a 'whole of fishery' effort or quota reduction are implemented.*"
>
> The Planning NSW environmental assessment guidelines also have similar requirements.

Given these requirements, it is likely that export restrictions will be imposed unless the draft FMS provides for a comprehensive recovery program for this species. This may include strictly limiting the number of active endorsements and the effort and/or catch, as well as considering changes to gear design, improved monitoring and increased resources for stock assessment.

Silver trevally is a second target species that has been determined as overfished (growth overfished)[1]. In recent years, silver trevally have been a very small part of the catch in the Ocean Hauling Fishery, however, in the mid-1980s large quantities of silver trevally were caught by purse seining in southern NSW. It is important that the proposed FMS reflects the steps likely to be taken to promote the recovery of that species in those fisheries that are major harvesters of silver trevally.

For the remaining target species, the potential within the Ocean Hauling Fishery for effort to be activated, particularly for some methods in some regions, is an important issue relating to sustainability. The entitlement structure in the Ocean Hauling Fishery relates poorly to how the fishery actually operates. This is a major problem in the management of this fishery as it means there is no meaningful control on overall fishing effort. Beach hauling methods use teams of endorsement holders to apply effort in the fishery, but the number of teams is only limited by the number of endorsement holders in a region. The number of endorsement holders has the potential in some regions to exceed acceptable levels (see Table B7). For example, the number of teams that could form, is several times more than the number of teams that do traditionally form. Furthermore, hauling teams are not a definitive unit of effort because the size of teams can vary greatly. The current loose connection between the endorsement structure and the teams that apply fishing effort and the nominal effort in a team is a risk in that the control of fishing effort is not clear. For example, the beach hauling sector has endorsements for skippers and crew but individuals with these endorsements must form associations (or teams) to fish and there is no management relationship with those associations. There are also many more skipper endorsements than are needed to form the 30-60 teams that fish each year.

[1] 'Growth overfishing' occurs when fishing activities lead to a reduction in the size of the individuals of a species, as a consequence of which few species grow to the size for optimum yield.

A related issue is that the rules differ relating to the use of unlicensed crew among the different methods in the fishery, giving rise to concerns about equity. Industry has said that the current entitlement structure commonly restricts access to crew because of limits on crew numbers and availability. In some cases crew members have been able to dictate whether or not a team can operate (or hold priority of shot).

c) Description of the fishery (area, gear and target species)

Many of the nets used in the Ocean Hauling Fishery currently have restrictions placed on the species that may be taken. Such restrictions include the prohibition on taking prohibited size class of fish with either a purse seine or pilchard, anchovy and bait net. These are generally broad restrictions, allowing many other species to potentially be taken. However, this is not the current or traditional practice with any of the methods used in the Ocean Hauling Fishery: all these methods traditionally target only a small number of species. The incidental catch in ocean hauling methods is also traditionally very low.

The gear used in the Ocean Hauling Fishery is also poorly described in many instances. For example, it is not clear which methods could be applied in open water from a boat. Similarly, some of the dimensions of the gear, as specified in the *Fisheries Management (General) Regulation 1995*, are open ended and rely on net registration certificates to define gear used by individual fishers.

Both the open-ended nature of the species that can be taken and of the design and operation of the fishing gear present a risk to the fishery through unforseen expansion of how methods are used or which species are targeted.

The beach-based sector of the Ocean Hauling Fishery is restricted in all regions by closed areas. Many of these closed areas are not known by the public. Conversely, many of the beach areas that are currently open to beach hauling are rarely, if ever used. The regional liaison process, completed in 1996, carefully set out agreements on the use of beaches in all but two of the regions of the fishery. These community negotiations resulted in a series of additional closures as well as identification of traditional hauling grounds. The current set of closures does not reflect this series of extensive negotiations and review of this position is warranted.

d) Veracity of catch record system

The importance of assessments for ocean hauling species brings the catch recording system into focus. There are several issues that highlight the need for accuracy in the catch recording system: possible double counting of catch, incorrect recording of small pelagic species and the lack of records from tuna operators authorised to take bait for their own use.

Double counting has been suggested in hauling teams where team members are uncertain whether the team leader has reported the total catch or just personal catch. There are a number of small pelagic species that may not be correctly identified or be consistently identified by all fishers. For example, the term “glass fish” is applied in two different categories on catch returns and it is likely that several species are all reported with the same common name. Similarly, it is clear that anchovy are commonly called “frog mouth pilchards” and that they are sometimes reported as pilchards instead of anchovies. These uncertainties in available information all become critical in measuring the quality of the stock assessment and monitoring.

e) Management of bait-for-own-use fishery

The collection of yellowtail scad, blue mackerel and pilchards for use as bait is an important fishing activity but has been poorly documented. There are more purse seine net permits issued for bait collection to Commonwealth tuna fishers than there are purse seine endorsements in the Ocean Hauling Fishery. These permits are granted to vessels or fishers with a demonstrated history of bait gathering by purse seine in NSW waters. The magnitude of this harvest on stocks of bait species is unknown. NSW also provides restricted licences to eligible Commonwealth tuna fishers who do not qualify for a permit to use a purse seine. This licence allows the use of a lift net to take bait for tuna fishing. NSW does not collect information about this use of bait resources and the eligibility criteria for such a licence are relatively easy to meet. NSW fishers may also use the lift net to gather bait for tuna fishing and this fishing activity has been recorded on State catch returns since July 1997.

f) Information needs in the fishery

Improving the information base used to make management decisions concerning the fishery is an important issue for the draft FMS. There is clearly an important need for improved biological and stock assessment information for the fishery, however, there are also a number of other areas where improved information, or improved communication of existing information are likely to benefit the fishery and the community. For example, the general community view about ocean hauling is largely based on fisheries where hauling nets have problems with bycatch and discarding. Most hauling in the Ocean Hauling Fishery is very targeted and bycatch issues are thought to be minimal. The fishery and the community would benefit from a wider understanding of fishery specific issues relating to ocean hauling.

CHAPTER C. THE DRAFT FISHERY MANAGEMENT STRATEGY

1. Introduction to the Ocean Hauling Fishery

a) Brief fishery description

The Ocean Hauling Fishery targets a relatively small number of species compared to other fisheries using similar gear. Approximately 99% of the catch by total landed weight is comprised of less than 20 finfish species (NSW Fisheries catch statistics database 1998/99), taken from ocean waters and sea beaches along the NSW coast using 5 types of commercial hauling and purse seine nets.

There were approximately 374 fishing businesses with one or more endorsements to operate in the Ocean Hauling Fishery in May 2001. There is a wide variation in the level of participation in the fishery with some fishers operating on a full time professional basis, whilst others operate on a part time or seasonal basis. Full time professional fishers can then be further differentiated between those who operate solely in the Ocean Hauling Fishery, and those who operate in a number of commercial fisheries in NSW. Table C1 below shows the relationship between the Ocean Hauling Fishery and other commercial fisheries in NSW.

b) Objects of the Fisheries Management Act 1994

The *Fisheries Management Act 1994* seeks to achieve ecologically sustainable development for the fisheries of NSW through the achievement of its stated objectives, which are:

(1) To conserve, develop and share the fishery resources of the State for the benefit of present and future generations.

(2) In particular the objects of the Act include:

(a) to conserve fish stocks and key fish habitats, and

(b) to conserve threatened species, populations and ecological communities of fish and marine vegetation, and

(c) to promote ecological sustainable development, including the conservation of biological diversity,

and, consistently with those objects:

(d) to promote viable commercial fishing and aquaculture industries, and

(e) to promote quality recreational fishing opportunities, and

(f) to appropriately share fisheries resources between the users of those resources, and

(g) to provide social and economic benefits for the wider community of New South Wales.

Table C1. Overview of the major marine commercial fisheries in NSW.

(Source: Fletcher & McVea, 2000; Tanner & Liggins, 2000; NSW Fisheries Licensing database – March 2001)

	Ocean hauling	Estuary general	Ocean trap and line	Ocean prawn trawl	Ocean fish trawl	Lobster	Abalone	Estuary prawn trawl
Methods	Beach seine net Purse seine net	Handline Trap Hauling net Mesh/gill net Hand	Demersal trap Handline Setline Dropline	Otter trawl net	Otter trawl net	Trap/pot	Diving (hookah)	Otter trawl net
Main species	Sea mullet Sea garfish Luderick Yellowtail Pilchards	Yellowfin bream Dusky flathead Sand whiting	Snapper Kingfish Morwong Spanner crabs	King prawn School prawn Royal red prawn	Silver trevally Tiger flathead Redfish	Rock lobster (eastern)	Black lip abalone	School prawn King prawn
Total catch in 1998/99 (t)	2,463	4,943	1,995	3,429	413*	110	323	495
Est. value in 1998/99 (A$m)	4.1	17.5	9.6	22.7	1.5	4.2	12.6	3.2
No. of authorised fishing businesses	374	944	630	330	102	170	37	294
Standard boat length (m)	4	5	6-8	14	14	6-8	6	9
General no. of unlicensed crew	0**	0***	0-1	2	2-3	0-1	1	1

* Partial catches only, see Fletcher and McVea (2000) for explanation

** Unlicensed crew permitted in some forms of boat-based hauling

*** Unlicensed crew permitted only when undertaking boat-based prawn seining

i) Ecologically sustainable development

Ecologically sustainable development (ESD) was defined under the National Strategy for ESD as "development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends". It can be achieved through the implementation of the following principles and programs[3]:

- precautionary principle – if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- intra-generational equity – the benefits and costs of pursuing ESD strategies should be distributed as evenly as practicable within each generation
- inter-generational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- conservation of biological diversity and ecological integrity – conservation of biological diversity and ecological integrity should be a fundamental consideration
- improved valuation, pricing and incentive mechanisms – such as user pays and the use of incentive structures to promote efficiency in achieving environmental goals.

c) The role of the fishery management strategy

The draft FMS outlines the rules, regulations and programs that are in place to manage the taking of fish by ocean hauling fishers. Outlining the proposed rules in the draft FMS allows an environmental assessment to consider the potential impacts of the activities proposed to be regulated in accordance with the draft FMS on biophysical, economic and social environments.

Information about the impacts of harvesting by other fishing sectors (such as recreational fishing) is also provided, however the rules applying to such sectors are dealt with under separate management arrangements.

i) The NSW Environmental Planning and Assessment Act

The evolution of the new environmental assessment process for commercial fisheries in NSW stems largely from a decision handed down by the Land and Environment Court in January 2000. The Court decided that the issue of an individual commercial fishing licence had to meet the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This meant that the environmental impacts of any authorised activities had to be assessed at the time the licence was issued or renewed.

It is widely accepted that in most cases the best way of assessing the impact of fishing activity is by considering the total impact of fishing, instead of the potentially minor impacts of individual fishers. The Government was concerned that requiring assessment for each individual licence would be an unnecessarily expensive and time-consuming activity. Licensed fishers would have faced a high level of uncertainty and significant individual costs.

[3] Adapted from section 6 (2) of the NSW *Protection of the Environmental Administration Act 1991*.

After thorough consultation with all stakeholders, the Government decided that the best approach would be to assess the environmental impact of fishing activities at the fishery level. This provides the best approach for both our aquatic environment and stakeholders. The legislation was subsequently amended to provide for the development of fishery management strategies and the environmental assessment of these strategies.

iii) The Commonwealth Environment Protection and Biodiversity Conservation Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) makes it an offence for a person to undertake an action that has the potential to significantly impact on a matter of 'national environmental significance' without first obtaining a permit from the Commonwealth Minister for Environment and Heritage. Matters of national environmental significance include: declared World Heritage areas; declared Ramsar wetlands; listed threatened species and ecological communities; listed migratory species; listed marine species; nuclear actions; and the environment of Commonwealth marine areas. As with the WP Act, this draft FMS details the controls proposed to manage the impacts of the Ocean Hauling Fishery on such matters.

The EPBC Act was also amended in January 2002 to incorporate the provisions of the Wildlife Protection Act (which was repealed at the same time). The new Part 13A of the EPBC Act has the effect of removing the previous blanket exemption from export control for marine species. As a result, the export of all marine organisms will come under the controls of the Act and be subject to ecological sustainability assessments based on guidelines established by the Commonwealth. To give time in which those assessments may be made, the exemption will continue until 1 December 2003. Until then, current arrangements regarding export of marine species will remain in effect, that is, the export of most marine fish and the bulk of marine invertebrates will continue to be exempt from export controls under the Act.

If a fishery is not assessed as exempt, it will more than likely be able to continue to supply product for export through an approved wildlife trade operation (section 303FN). These declarations will have conditions attached that will bring the management and operations of the fishery in line with the Commonwealth guidelines. Once declarations are made, exporters will need to apply for and obtain from Environment Australia a permit to export. The responsibility of implementing the necessary changes to the fishery management arrangements will rest with the management authority.

iv) The Marine Parks Act

The *Marine Parks Act 1997* was introduced to provide for the declaration of marine parks in NSW. The Act and associated regulations aim to protect biodiversity and provide for a variety of users (where consistent with the primary objective) by way of zoning and operational plans. These are required for all marine parks and the zones clearly identify the conservation and management priorities within marine parks (MPA, 2000). The objects of the Act are as follows:

(a) to conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive system of marine parks,

(b) to maintain ecological processes in marine parks,

(c) where consistent with the preceding objects:

(i) to provide for ecologically sustainable use of fish (including commercial and recreational fishing) and marine vegetation in marine parks, and

(ii) to provide opportunities for public appreciation, understanding and enjoyment of marine parks.

The draft FMS has been prepared taking into account, and ensuring consistency with, the objects of the *Marine Parks Act 1997*.

At the time of drafting the FMS and EIS for the Ocean Hauling Fishery, there were no regulations in place, with respect to zoning plans for any marine park in NSW. Consultation was taking place however, on draft zoning plans for the Solitary Islands Marine Park and the Jervis Bay Marine Park and the permissible uses proposed under those plans.

d) The role of the share management plan

The *Fisheries Management Act 1994* requires that a share management plan be developed and implemented for all share management fisheries. A share management plan is made by regulation and provides a legislative structure for the class or classes of shares and the rights of shareholders under a full share management regime. Further information on the transition of the Ocean Hauling Fishery to full share management can be found in section 6(a) of this draft FMS.

The share management plan may also bring into operation a number of aspects of the fishery that are described in this draft FMS. These include the fish that may be taken, the areas for taking fish, the times or periods for operating the fishery, the protection of fish habitats, the use of boats and fishing gear and the use of bait in the fishery.

A share management plan must include objectives and performance indicators, which for the Ocean Hauling Fishery will be consistent with those outlined in sections 4 and 5 of this draft FMS.

e) Issues within the Ocean Hauling Fishery

The review of the existing operation of the Ocean Hauling Fishery in Chapter B identified a number of issues in the fishery that need to be addressed as part of this draft FMS. Those issues include:

- managing impact of the fishery on species and communities not targeted by the fishery
- sustainability of target species
- description of the fishery (area, gear and target species)
- veracity of catch record system
- management of bait-for-own-use fishery
- information needs in the fishery

Section 3 of this chapter outlines these issues and describes how the draft FMS proposes to address the issues through the implementation of management responses.

2. Vision and Goals for the Fishery

a) Fishery vision

The vision for the Ocean Hauling Fishery is:

A profitable Ocean Hauling Fishery which provides the community with fresh local seafood and high value exports, and carries out fishing in an ecologically sustainable manner.

b) Fishery goals

The proposed goals that have been set for the fishery to assist in achieving this vision are:

1. to manage the Ocean Hauling Fishery in a manner that promotes the conservation of biological diversity in the coastal environment
2. to maintain fish populations harvested by the Ocean Hauling Fishery at sustainable levels
3. to promote the conservation of threatened species, populations and ecological communities associated with the operation of the Ocean Hauling Fishery
4. to appropriately share the resource and carry out fishing in a manner that minimises social impacts
5. to promote a viable commercial fishery (consistent with ecological sustainability)
6. to ensure cost-effective and efficient ocean hauling management and compliance programs
7. to improve public understanding of the fishery and of the resources upon which the fishery relies
8. to improve knowledge of the Ocean Hauling Fishery and the resources upon which the fishery relies.

3. Proposed Changes to the Operation of the Fishery

Section 7 of Chapter B described the key management issues arising from the existing operation of the fishery that need to be addressed by the FMS. These issues are listed below along with a description of the actions or changes to management of the fishery proposed to address them. Please refer to Chapter B for a full description of how the Ocean Hauling Fishery currently operates and in particular, section 7 of Chapter B for further discussion of the management issues that have been identified.

a) Managing impact of the fishery on species and communities not targeted by the fishery

The impact of the fishery on species not targeted by the fishery includes impacts on bycatch (i.e. discards) and byproduct species, impact of fishing gear on sensitive habitats and interactions with threatened or protected species. Levels of bycatch in the Ocean Hauling Fishery have not been formally described but are anecdotally thought to be low (for more details, see section 2 of Chapter E).

Much of the fishing in the fishery takes place in either open water or on beaches where impacts of fishing on habitats have not be described but are also thought to be low. Similarly, there is no information on interaction with threatened or protected species and no particular concerns have been raised. Marine mammals and birds are known to be attracted to aggregations of fish and as such, interactions with ocean hauling methods will occur.

The draft FMS proposes a range of measures to minimise the impact of this fishery on habitats, bycatch and byproduct species and threatened species and communities. These include:

- design and implement an observer-based study that will initially focus on areas of highest risk and will record the interaction of ocean hauling fishing methods on fish habitats and on threatened species and document the rate and species composition of bycatch
- prevent directed fishing for non-target species and limit the total landings of these by-product species
- adaptively modify fishing practices to reduce the impacts of the fishery on all non-target species
- use best-practice techniques for the handling of incidentally captured organisms
- the Ocean Hauling Management Advisory Committee (MAC) will contribute to reviews of the NSW Fisheries habitat management policy and guidelines or habitat protection plans which aim to prevent or reduce impacts of all activities on aquatic habitats
- use the results from the observer study to modify the use of fishing methods that have a detrimental impact on fish habitat, or threatened species populations or ecological communities
- prohibit the use of the general purpose hauling net over beds of the strapweed (*Posidonia australis*)
- collaborate with other institutions to better understand the concepts of ecosystem function and the individual importance of harvested and other species populations and ecological communities

- the Ocean Hauling MAC will have the opportunity to comment on the selection and ongoing management of marine protected areas in ocean waters
- modify the catch and effort returns, in consultation with Ocean Hauling MAC, to collect and monitor information on sightings or captures of threatened species
- to manage the Ocean Hauling Fishery consistently with other jurisdictional or natural resource management requirements, such as the marine parks program, aquatic biodiversity strategy, threatened species program and others.

b) Sustainability of target species

This relates to ensuring that the species harvested by this fishery are fished at a level that minimises the risk of overfishing the stocks. Because the fishery is managed by input controls, the key issue with respect to controlling the level of harvest is controlling the amount of fishing effort that is applied to the stock. Controlling fishing effort can include very specific measures such as regulating the size and dimensions of the fishing gear used, but at a broader level involves measures such as controls on the number of fishers who have access to (or are 'endorsed' to operate in) each part of the fishery.

The review of the existing operation of the fishery has highlighted several risks with respect to shifts of effort into or within the fishery, and the relationship between an authority to fish and the way effort is applied in team-based methods. Other key issues that need addressing are the overfished status of garfish and silver trevally stocks and the need to promote stewardship over the fishery resources.

To address these issues, the draft FMS proposes:

- detailed monitoring of the landed catch, including length and age of target species and species composition. Monitoring will include annual assessment of catch by method among fishery regions
- provide stock assessments and biological reference points for all target species within five years of approval of the strategy
- development of a program to ensure ongoing improvement in stock assessments of target species and continue to foster research that leads to improved fishery assessments
- development of and/or participation in recovery programs for overfished species and setting of precautionary management while awaiting development of recovery programs in other fisheries. Development of a recovery program for sea garfish within six months of approval of the strategy
- the use of species-based closures as the preferred means of implementing short-term (up to several years) constraints on active fishing effort as required. The control of the long-term application of effort through minimum shareholdings for each method
- clarify and/or expand controls on nominated fishers, entry criteria for new entrants and controls on engine size.

c) Description of the fishery (area, gear and target species)

Much about the fishing gear used in the Ocean Hauling Fishery is prescribed in regulations, however, some gear definitions are open-ended. The species allowed to be taken in some ocean

hauling nets have been specified but all methods used in the fishery are highly targeted and it is possible to define all species targeted by the fishery and to provide rules for restricting catch of byproduct species. Despite a range of total, seasonal and weekend closures, ocean hauling from beaches is permitted on many more beaches than are commonly used by the fishery.

A process for community and industry negotiation of identifying traditional hauling grounds and closing other areas took place in 1995 and 1996 and covered most areas in the state. There is strong industry support to implement this definition of hauling grounds and closed areas, and to extend the consultative process to those areas not included in the mid 1990's.

To address these issues, the draft FMS proposes to:

- limit species taken by each net type to those prescribed in Appendix C1 for each of the Ocean Hauling Fishery methods and include provisions for the landing of byproduct (i.e. all other species not targeted but retained)
- limit the size and dimensions of gear permitted to be used in the Ocean Hauling Fishery. Complete, as far as possible, an explicit definition of the application of all gear types in the fishery
- review on an annual basis the established code of conduct, enforceable by conditions on licence, for the beach hauling sector of the fishery which outlines rules for:
    - operating on beaches that minimise environmental impacts in those areas
    - operating in the vicinity of areas used by recreational fishers
    - the use of gear and the behaviour of commercial fishers, and/or
    - encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken.
- develop a code of conduct, to be enforceable by conditions on licence, for the purse seine sector of the fishery with respect to:
    - operating in the vicinity of areas used by recreational fishers or on fishing grounds subject to intense recreational bait gathering
    - the appropriate handling methods for incidental catches of marine birds or mammals
    - the use of gear and the behaviour of commercial fishers
    - encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken.
- Completing by July 2004, the regional liaison process which provided locally negotiated outcomes for beach access locations, for shared, closed and traditional hauling beaches and for local amendments to the code of conduct.

d) Veracity of catch record system

The harvest in the beach fishery by teams of individuals is often at odds with the structure of the catch reporting system, which is based on individual reports. This may have led to anomalies in converting the catch of a team to the catches of the individuals in that team. There is also a need to ensure the accuracy of the species identified on catch returns and the consistency of the application of common species names used in the fishery.

The draft FMS proposes the following changes:

- daily catch and effort reporting by all beach hauling teams during the mullet travelling season
- periodically review, in consultation with the Ocean Hauling MAC, the mandatory catch and effort return forms submitted by ocean hauling fishers and implement changes if:
  - the data collected is perceived to be of poor quality or insufficient for the purpose of conducting an environmental assessment
  - the forms are found to be exceedingly complex for fishers to complete, ensuring an emphasis on the quality rather than quantity of information collected
- determine accuracy of current recording of species identification in catch records and provide advice to industry to make needed changes (may need to wait for results from observer study)
- ensure that catch reporting in the Ocean Hauling Fishery accurately reflects the landings and the composition and effort of the crew that made those landings
- provide means by which ocean hauling teams can report fish observed but not caught.

e) Management of bait-for-own-use fishery

Many other commercial and recreational fisheries have an interest in the use of small pelagic species targeted by the purse seine sector of the Ocean Hauling Fishery as bait. The harvest of bait by State line fishers and Commonwealth fishers who target tuna is largely undescribed and uncontrolled and is collectively, with the recreational harvest, likely to be a similar magnitude as the harvest by the purse seine sector. The draft FMS proposes a description and system of regulation of the harvest by commercial fishers of bait will be developed, including:

- development and implementation by 2004 of a policy to manage the harvest of bait for the Commonwealth tuna fishery in NSW waters. Items to be considered in the development of this policy will include:
  - determining a cap on the number of permits issued
  - including this fishery in the observer program for ocean hauling purse seiners
  - documenting all bait harvest in logbooks
- development and implementation of a policy to manage the use of the lift net for collection of bait by NSW line fishers. Items to be considered in the development of this policy will include:
  - determining on what basis access will be allowed
  - including this fishery in the ocean hauling observer program
  - documenting all bait harvest in logbooks.

f) Information needs in the fishery

Information needed by those who influence management policy and by those who have an interest in the fishery has been an issue identified as needing improvement. The most important area of need is providing general information about the fishery to relevant stakeholder groups and to the community generally. The operating environment, target species, harvests and bycatch of the Ocean

Hauling Fishery are poorly understood in the community. Ocean hauling fishers see a need to promote understanding of their operations in order to prevent misunderstandings in the community about bycatch and habitat interactions in their industry. This draft FMS proposes a range of management responses that will improve the flow of information to and from the fishery including:

- monitoring catch levels and management structure in fisheries that are outside NSW jurisdiction but where catches in those fisheries impact on stocks shared with the Ocean Hauling Fishery
- monitoring the catch of the target ocean hauling species that are also taken in other NSW fisheries (i.e. Estuary General Fishery, Ocean Trap and Line Fishery)
- promoting results of new scientific study, such as the observer program or stock assessment studies, in order to improve the setting of future research priorities
- publishing successful prosecution results for nominated offences in relevant publications and media to discourage illegal activity
- providing a continuing education strategy for fishers and NSW Fisheries contact officers
- making the final FMS, environmental assessment and other relevant documentation widely available to the public by:
    - placing them on the NSW Fisheries website
    - providing copies at Fisheries Offices throughout the State, and/or
    - targeted mail outs to key stakeholders
- producing or contributing to the production of brochures, newsletters and signs, and undertaking targeted advisory and educational programs as required, ensuring advisory material is appropriate to the target audience
- responding to inquiries by industry or the public with respect to the final FMS or the fishery generally
- publishing educational information concerning the protection of fish habitat on the NSW Fisheries website and in other relevant publications and media.

4. Goals, Objectives and Management Responses

This section sets out the goals, objectives and management responses for the Ocean Hauling Fishery.

a) A model framework

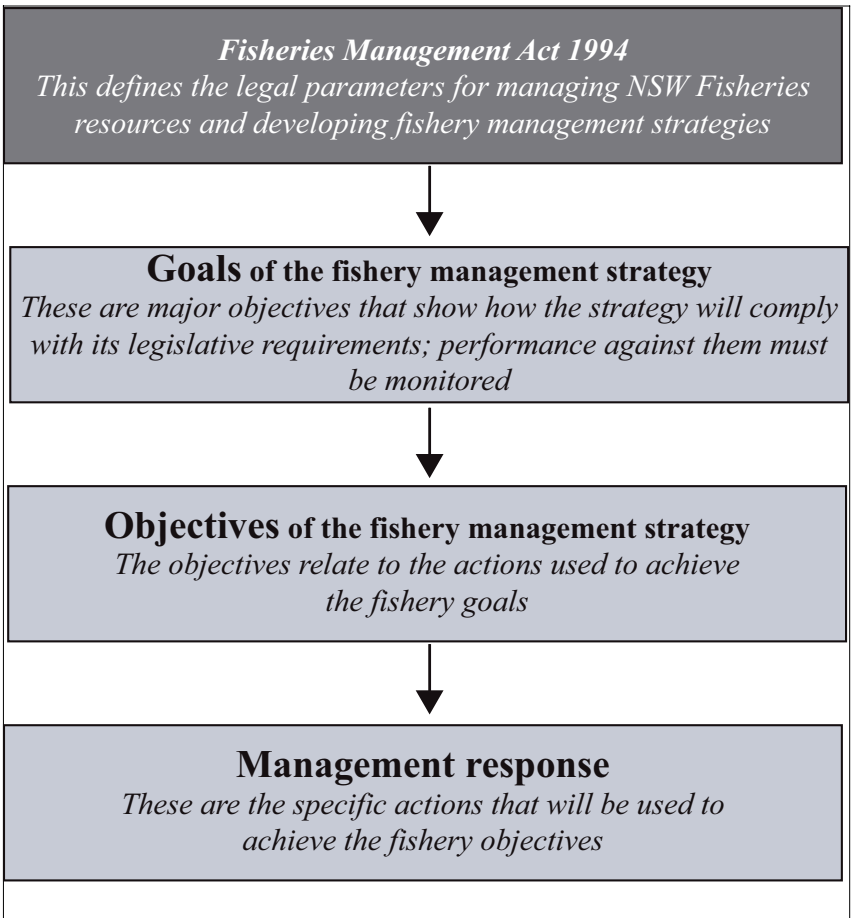


Figure C1. A model of the framework for a fishery management strategy.

The link between the goals, objectives and management responses is not as simple as that portrayed in Figure C1. The reality is that most management responses assist in achieving more than one goal.

A fishing closure is one example of the complex relationships that exist in a multi-method multi-species fishery. Some closures were originally put in place to more fairly share access between recreational and commercial fishers. A closure to reduce conflict appears to fit into the "resource sharing" goal, however, it can have other benefits, and assist the fishery to meet other objectives.

For example, a closure can also reduce the level of fishing pressure in that area and provide greater protection to habitat and biodiversity. This outcome provides a range of benefits for the fishery over and above reducing conflict (see Figure C2).

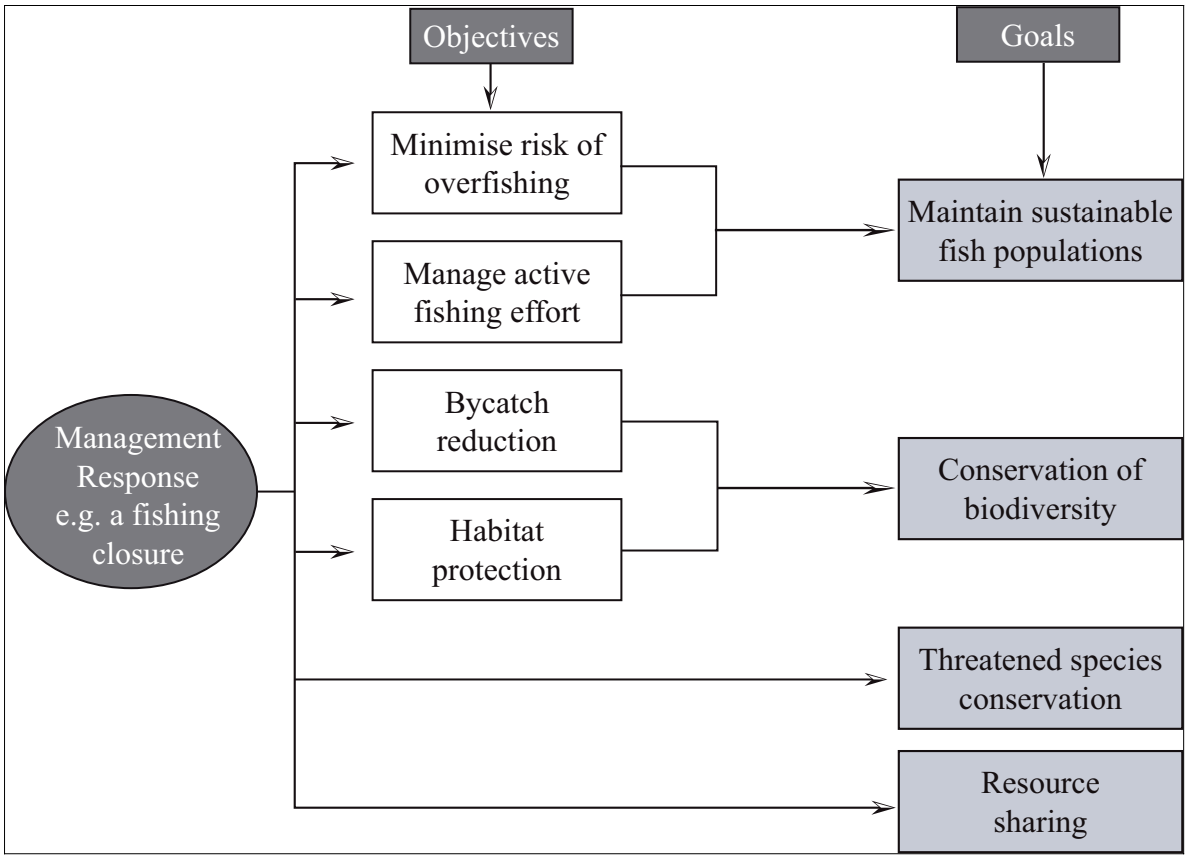


Figure C2. Example of how a single management response affects multiple goals and objectives.

This complex structure has been dealt with under this section by listing each of the management responses once only, under the objective that the response contributes most towards achieving. There are cross references between each response and the other goals and objectives that the response may also assist in achieving. When identifying the responses that are in place to achieve a particular objective, it is important to look at the cross referenced responses as well as any listed individually under the objective (i.e. the "Other important responses" must be taken into account).

Information under each response is also provided detailing the time frames in which the action will be undertaken, the agency or group responsible for implementation and the authority under which the action will be implemented.

b) Goals, objectives and management responses

GOAL 1. To manage the Ocean Hauling Fishery in a manner that promotes the conservation of biological diversity in the coastal environment

Objective 1.1 To minimise the impact of fishing activities on non-retained species (including prohibited size or unwanted species)

Other important responses: 2.1c; 2.2b,h; 4.1b; 4.5a–c;

(a) Design and implement an industry-funded study using scientific observers to achieve the following objectives:

- document the likelihood of interaction with ocean hauling fishing methods on fish habitats and on threatened species
- document rate and species composition of bycatch
- estimate the accuracy of reporting using standard catch returns including both the quantity caught (and released) and the identity of the species recorded (including threatened and endangered species).

Background: There are no quantitative data on rates of discards, non-target capture, habitat impacts or catches of threatened species. All of these are thought to be very low for all methods in the Ocean Hauling Fishery. Despite the expectation of low risk, the observer study should identify, during the design phase, the areas of highest risk concerning impacts on habitats, threatened species and the likelihood of bycatch. The distribution of species of concern and of sensitive habitats must also be used to assist in arriving at the design of the observer study. The observer study should be focused in such a way as to generate information to provide appropriate priority setting for new research programs (see responses under objective 8.1).

There are a number of areas that could initially receive focused attention from the observer program. Initial studies on purse seine fishing could focus on areas where interaction with penguins are thought to be likely. Fishers with small catches of reef-associated species could be an appropriate place to commence observation of the general purpose and purse seine nets. The general purpose hauling net targets fish with minimum size restrictions and it may be most appropriate to focus on the capture of undersize fish as a matter of priority. A further output from the observer study will be data that can be used to calculate relative mesh selectivity among the fishing gears being observed. A demonstration of low rates of bycatch will provide great substance to the parts of the draft FMS that seek to minimise impacts on species other than target species. If the program proves these issues to be incidental in the Ocean Hauling Fishery, there would be no need to keep the program ongoing and repeat estimates would only be needed every 5-10 years or when a change in gear or practice necessitated new information.

Contributing to Goals	Timeframe	Responsibility	Authority
2,3,4,7,8	From 2002	NSW Fisheries OH Fishers	Regulatory

(b) Using best available knowledge and appropriate technology, modify fishing practices to reduce the impacts of the fishery on non-retained fish, invertebrates, reptiles, mammals and birds.

Background: *The National Policy on Fisheries Bycatch provides a national framework for coordinating efforts to reduce bycatch. It provides options by which each jurisdiction can manage bycatch according to its situation in a nationally coherent and consistent manner. Any changes to fishing practice that transpire under this management response could be implemented through conditions in the relevant fishing endorsement or through a code of conduct, depending on the nature of the change.*

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	Current and ongoing, reviewed every 3 years	NSW Fisheries OH fishers	Regulatory or Voluntary

(c) Use best-practice techniques for the handling of incidentally captured organisms.

Background: This could include using techniques for sorting fish while still in the net by using escape grids, transparent panels or sorting pens, as appropriate.

Contributing to Goals	Timeframe	Responsibility	Authority
3,4	Current and ongoing, reviewed every 3 years	NSW Fisheries OH fishers	Regulatory & Code of Conduct

(d) Continue the restrictions on the use of fishing gear contained within the *Fisheries Management (General) Regulation 1995* including controls on the dimensions, construction materials and modes of operation (unless otherwise described by this draft FMS).

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	Ongoing	NSW Fisheries	Regulatory

(e) Continue the prohibition on using firearms, explosives or electrical devices to take fish in the fishery

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	Ongoing	NSW Fisheries	Regulatory

Objective 1.2 To minimise the impact of activities in the fishery on marine and terrestrial habitat

Other important responses: 1.1a,e; 1.3d; 2.1c; 2.2b,h; 2.4a; 4.5a,b

(a) The Ocean Hauling MAC will provide advice and contribute to reviews of the NSW Fisheries habitat management policy and guidelines or habitat protection plans, which aim to prevent or reduce impacts of all activities on aquatic habitats.

Background: Habitat management guidelines and plans have been and will continue to be prepared under the Fisheries Management Act 1994 *to prevent or minimise the impact of all types of activities on fish habitat.*

Contributing to Goals	Timeframe	Responsibility	Authority
2,6,7	Ongoing	NSW Fisheries OH MAC	-

(b) Modify the use of fishing methods that have a detrimental impact on fish habitat, or threatened species populations or ecological communities.

Background: Where fishing methods are known to be having detrimental impacts on juvenile fish or on threatened species, etc, their use should be modified so as to avoid or minimise those impacts. The independent observations of fishing practices generated by the observer studies will provide important information to assist this process.

Contributing to Goals	Timeframe	Responsibility	Authority
2,6,7	Ongoing	NSW Fisheries OH MAC and fishers	Various

(c) Continue the prohibition on damaging marine vegetation. Specifically:

i) identify all areas where ocean hauling takes place over the seagrass *Posidonia australis* (strapweed).

ii) identify the ocean hauling methods that occur in those areas

iii) prohibit the use of the general purpose hauling net in such areas.

Background: There is very little Posidonia *in areas where ocean hauling takes place and it is not known what type of closure is most appropriate in each situation. Pelagic ocean hauling methods over deeper seagrass beds should not have an impact on* Posidonia*. To maintain consistency with the proposed Estuary General FMS, the prohibition on the general purpose hauling on* Posidonia *is extended to the Ocean Hauling Fishery.*

Contributing to Goals	Timeframe	Responsibility	Authority
4	Current & ongoing July 2003 for *Posidonia*	NSW Fisheries	Regulatory

Objective 1.3 To reduce the likelihood of this fishery changing species, populations and ecological communities in a manner which threatens ecosystem intergrity (i.e. composition and function)

Other important responses: 1.1a–e; 1.2a–c; 2.1a; 2.2b,c,e,f,h; 2.4a; 2.5a,b,h,i,j; 4.5a,b,c; 6.4a; 8.1b,c; 8.2a–,e

(a) Limit species taken by each net type to those prescribed in Appendix C1 for each of the Ocean Hauling Fishery methods and include provisions for the landing of byproduct.

Background: The Fisheries Management (General) Regulation 1995 *details the species to be taken by certain net types, such as a pilchard, anchovy and bait net, garfish net (bullringing) and lift net. Appendix C1 proposes the details of the species that may be targeted by each of*

the net types used in the Ocean Hauling Fishery. The Appendix also provides the rules and provisions for dealing with byproduct for each method in the fishery. In broad terms, each method in the fishery is restricted to a total catch of non-target species not to exceed 5% of landings. On a shot-by-shot basis, up to 20% of a shot is permitted to be non-target species. These restrictions will apply on a state-wide, regional and business basis.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	July 2002	NSW Fisheries OH Fishers	Regulatory

(b) Collaborate with other institutions to better understand the concepts of ecosystem function and the individual importance of harvested and other species populations, and ecological communities.

Background: There is no simple performance measure currently available to give an accurate representation of the impacts of the Ocean Hauling Fishery on biodiversity. Performance measures are needed for biodiversity impacts at the species, community and ecosystem levels. Careful thought must be given to deciding the most appropriate performance measure (and trigger points), so as to avoid expending resources unnecessarily on monitoring unrepresentative or inappropriate indicators. This will require substantial research over many years to determine the best approach and useful performance measures may be unavailable for some time. Collaboration among fishery management, scientific and stakeholder groups will be essential to the development of appropriate indicators.

Contributing to Goals	Timeframe	Responsibility	Authority
6,8	Ongoing	NSW Fisheries other institutions	-

(c) Contribute to relevant biodiversity monitoring programs.

Background: Research that contributes to our understanding of biodiversity is carried out by a number of institutions and a coordinated program is likely to be a key strategy within the aquatic biodiversity strategy currently being developed for NSW.

Contributing to Goals	Timeframe	Responsibility	Authority
3,6,8	Current & ongoing	NSW Fisheries	-

(d) The Ocean Hauling MAC will have the opportunity to comment on the selection and ongoing management of marine protected areas in ocean waters.

Background: A comprehensive system of representative marine protected areas (i.e. marine parks and aquatic reserves) is being declared in NSW to protect and enhance marine and estuarine biodiversity. Large marine bioregions have been identified by the Interim Marine and Coastal Regionalisation for Australia (IMCRA) report.

Contributing to Goals	Timeframe	Responsibility	Authority
2,3,4,6,7	Current & ongoing	OH MAC	-

(e) Continue the prohibition on taking or selling declared 'noxious fish'.

Contributing to Goals	Timeframe	Responsibility	Authority
-	Current & ongoing	NSW Fisheries	FM Act

(f) Promote research on the impacts of fishing on the general environment, in particular, pursue the research priorities identified in section 6(g) of this draft FMS.

Background: Like most fisheries around the world, direct effects of the Ocean Hauling Fishery are poorly understood and indirect effects are unknown. The direct impacts of ocean hauling methods on habitats and species of importance are thought to be low, but are not known. The early stages of the proposed observer study will examine areas and methods thought to be of the greatest relative risk in the fishery in order to help determine the priority for further observer work and for any new studies needed to determine the direct impact of the fishery.

The Ocean Hauling Fishery also needs to promote and support long-term research that aids understanding of the impact of the fishery in an ecological setting.

Contributing to Goals	Timeframe	Responsibility	Authority
2, 3, 7, 8	Ongoing	NSW Fisheries and OH MAC	-

Objective 1.4 To prevent the introduction and translocation of marine pests and diseases

Other important responses: 1.3e; 2.4b,c; 6.4a

(a) Implement, in consultation with the Ocean Hauling MAC, measures required in accordance with any marine pest or disease management plans.

Background: NSW Fisheries or other authorities may alter management arrangements from time to time to minimise or mitigate the impact of marine pests and diseases. A recent example of an outbreak of disease was the mass mortality of pilchards across southern Australia. A system of closures and monitoring was implemented in NSW during that outbreak and that process should be developed into a general strategy for dealing with disease outbreaks.

Contributing to Goals	Timeframe	Responsibility	Authority
2,6	Current & ongoing	NSW Fisheries OH MAC	To be determined

GOAL 2. To maintain fish populations harvested by the Ocean Hauling Fishery at sustainable levels

Objective 2.1 **To ensure that the quantity and composition (e.g. size, age, sex) of species harvested does not result in overfishing**

Objective 2.1.1 **To maintain the stock of the target species: yellowfin bream, yellowtail, blue mackerel, sea garfish, luderick, sea mullet, pilchards, sweep, dart, jack mackerel, bonito, silver trevally, Australian salmon, sandy sprats (whitebait), anchovy and sand whiting at or above a level that minimises the risk of overfishing**

Other important responses: 1.1a,b,d,e; 1.2a; 1.3a,d; 2.2a–f,h; 2.3a,b; 2.5ab,f,h–j,l; 4.1a,b; 4.2a,b; 4.5a; 5.2d; 5.4b; 6.1a,b; 8.1b,c; 8.2a–e

(a) Monitor the quantity, length, age and/or sex composition of commercial landings of the target species of the Ocean Hauling Fishery.

Background: Information on the structure of the landed catch is essential for stock assessments. Length, age and gender monitoring is already undertaken for many of the target species at the Sydney Fish Market, other fish processors, and at point of landing throughout the State. The mandatory monthly catch and effort returns are used to collect information on the quantity of the commercial harvest. This monitoring provides a basis for cross comparison and validation of the size and composition of commercial landings, independent of mandatory returns. Monitoring done in this program also provides a valuable cross reference for the observer program in the form of estimates of landings structure and composition that can be compared with the same information generated by observers.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,7,8	Ongoing	NSW Fisheries	-

(b) Develop a stock assessment of target species within five years and ensure the assessments are reviewed every three years thereafter.

Background: Information to assess stock levels for target species is at different stages, from having recent major projects to having little information to include in an assessment beyond catch and effort information. It is intended that the quality of the information and the nature and quality of the stock assessment continually improve. Stock assessments for target species will allow a change from landings-based monitoring to the use of biological reference points for monitoring of stock status. It is important to note that stock assessments are done on a species basis and are therefore reliant on harvest estimates from <u>all</u> sectors.

The review process is essential for ensuring the ongoing improvement of stock assessments and the research programs providing information for them. See section 5(g) in this Chapter.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,7,8	By July 2007	NSW Fisheries	-

(c) Limit the size and dimensions of gear permitted to be used in the Ocean Hauling Fishery to the specifications provided in Appendix C1 and expand Appendix C1 to provide an explicit definition of all gear types used in Ocean Hauling Fishery.

Background: The Fisheries Management (General) Regulation 1995 *provides the dimensions of the net types included in the Ocean Hauling Fishery, including variations in the dimensions based on area and time of year. Appendix C1 also provides the proposed dimensions and descriptions of how each net is to be used within the fishery.*

Most of the nets used in the fishery are well defined but there remain areas that could be made clearer. For example, it could be made explicit that only a purse seine net may have rings. Because the fishery environmental assessments must consider possible use of gear, as well as current common use, explicit definitions of the gear should make the assessment easier.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,6	By July 2002	NSW Fisheries	Regulatory

(d) Continue to use size limits on selected species to prevent the exploitation of juvenile or sub-adult and/or mature fish as appropriate.

Background: Minimum legal lengths will continue to be applied to some species caught in the Ocean Hauling Fishery. For other species, it may be more appropriate to adjust the minimum size at capture by making selectivity of the fishing gear more appropriate or by having effective, harmless ways of sorting fish post-capture. This response is aimed in part at sustainable egg production and that objective may be achieved by other means.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	Current & ongoing	NSW Fisheries	Regulatory

(e) Promote research that contributes to more robust and reliable fish stock assessments and continue to respond to the Ocean Hauling MAC in prioritising research programs.

Contributing to Goals	Timeframe	Responsibility	Authority
8	Current & ongoing	NSW Fisheries	-

Objective 2.2 To conserve fish stocks by managing levels of active effort in the fishery

Other important responses: 1.1d,e; 1.3,d; 2.1b,c; 2.3a; 2.5a,b,e,f,h–j; 4.1b; 4.5a; 6.1a,b; 8.2a,d

(a) Improve management control of engine size on licensed fishing boats utilised in the beach-based fishery.

Background: Refer to section 5(b)(iv) in Chapter B.

Contributing to Goals	Timeframe	Responsibility	Authority
4	Ongoing	NSW Fisheries	Regulatory

(b) Continue the prohibition on the use of unregistered fishing nets in the fishery, and the requirement that nets must meet the physical dimensions specified on registration certificates.

Background: Net registrations provide an additional control on fishing nets. Many registered nets meet specifications more restrictive than those in the Regulation and could not be upgraded to the maximum allowable dimensions without an appropriate net registration.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,6	Ongoing	NSW Fisheries	Regulatory

(c) For each method in the Ocean Hauling Fishery use species-based closures as the preferred means of implementing short-term (up to several years) constraints on active fishing effort as required.

Background: Current entitlements to ocean hauling methods do not relate directly to fishing effort. Restraints on these entitlements (e.g. transfer rules) provide for long-term restructuring of fishing effort. The preferred approach for constraining fishing effort that meets possible needs for short-term action is to implement closures based on species, in preference to closures of methods or areas. Ocean hauling methods are sufficiently specific that removal of the entitlement to target a species for the duration of the closure should be an effective and efficient control on fishing for that species.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5	As needed	NSW Fisheries	Regulatory

(d) For each hauling-based method in the Ocean Hauling Fishery, use minimum shareholdings to determine access to the method.

Background: Shares are to be used to provide flexibility in the formation of hauling teams and to establish the link between fishing effort and team formation. For each method, in each region, a minimum shareholding will be required to make a team of two. This shareholding will be set separately for each region. The shareholding required to work larger teams will increase pro-rata *from that number. For example, a team of four will require twice the shareholding as a team of two. The shares may be held by any combination of team members, including a single person. Providing the team has sufficient shares, persons in the team may comprise any licensed fishers (that is, not restricted to current endorsement holders). This can also provide for adjustment in the future to improve viability if needed.*

Shares could be used to determine a defined level of access rather than absolute access. For example, each share could provide a number of days of access to fishing with a method. That way, small shareholders could remain active in the fishery, albeit at a low level.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5,8	By July 2004	NSW Fisheries	-

(e) Develop and implement a policy to manage the harvest of bait for the Commonwealth Tuna Fishery in NSW waters.

Background: More than 40 Commonwealth tuna fishers and/or boats currently have permits under Section 37 of the FM Act which allow the harvest for bait of selected species from NSW waters (See section 5(b)(xi) of Chapter B). The first step of the policy will be to limit ongoing permits to existing permit holders and cease issuing any new permits for tuna bait gathering. The new policy will provide for the following:

- *inclusion of permit holders in an appropriate code of conduct as a permit condition*
- *inclusion of permit holders in any observer programs required for the class C (purse seine) sector*

- *development of an appropriate reporting system for permit holders to document all bait harvest*
- *a cap on the maximum number of permits that can be issued and a means of offering those permits by tender to all Commonwealth tuna fishers*
- *a means of adjusting the number of permits to reflect both the sustainability and environmental needs of the fishery as well as the demand for access to the resource*
- *refine the definition of the purse seine gear or other controls to reflect the need to collect live bait only and discourage the collection of baits that could be purchased from NSW class C (purse seine) endorsement holders*
- *determination of the need and suitability of using lift nets in place of purse seine nets for bait gathering.*

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,7,8	By July 2004	NSW Fisheries	-

(f) Develop and implement a policy to manage the use of the lift net for collection of bait by NSW line fishers.

Background: In 1985 a concession was introduced to allow anyone to use lift nets for taking bait (pilchards, yellowtail and blue mackerel) for own use for tuna fishing. In 1995 the lift net was prescribed in the Regulations. The lift net is not part of any restricted fishery and must be included in a management strategy and assessed under EIS legislation to continue to be used. The Ocean Hauling Fishery is the primary harvester of these bait species and it is appropriate that this use of these resources is managed in association with ocean hauling.

In the three years from July 1997 (i.e. since fishers have been reporting bait for own use), 15 fishers have used lift nets to collect bait. A permit, with conditions similar to those for Commonwealth fishers, will be used to manage access to this resource. The policy must be developed in consultation with the Ocean Trap and Line MAC, in particular, the policy regarding eligibility criteria for access to permits. The policy will also provide for:

- *inclusion of permit holders in an appropriate code of conduct as a permit condition*
- *inclusion of permit holders in any observer programs required for the class C (purse seine) sector*
- *development of an appropriate reporting system for permit holders to document all bait harvest*
- *a means of adjusting the number of permits to reflect both the sustainability and environmental needs of the fishery as well as the demand for access to the resource.*

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,7,8	By July 2004	NSW Fisheries	-

(g) Develop a nomination policy for all sectors of the Ocean Hauling Fishery.

Background: Consultation with fishers in July 2001 suggested diverse opinions about the use of nominations in this fishery and the MAC needs to consider what rules should be applied. See section (b)(viii) in Chapter B for more information on nominations.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	By July 2004	NSW Fisheries	Regulatory

(h) Continue the licensing arrangements described in the proposed management strategy (see section 6(i) of this chapter).

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,6	Current & ongoing	NSW Fisheries	Various

(i) Develop an index of relative fishing power between boat-based and beach-based hauling (for methods that are common to both) and introduce appropriate management controls based on the differences in fishing power

Background: The effort applied to catch fish hauling from a boat compared to using the same method from a beach is not comparable. The hauling from the beach involves a team of fishers where hauling from a boat may involve fewer individuals. The geographical access to fish is also different between the two types of hauling.

A definition of the relative fishing power between beach- and boat-based methods can be used to correct for real differences in fishing power and adjust (any) minimum share levels that define access or differences in the characteristics of authorised gear.

This will require a clear definition of beach and boat-based hauling. The definition of beach-based hauling must not preclude the landing of the net to a boat in shallow water. This practice allows improved handling and release of unwanted catch and should be encouraged.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5	July 2004	NSW Fisheries and OH MAC	Regulatory

Objective 2.3 To prevent the activation of latent (unused) fishing effort by new entrants

Other important responses: 2.2e–h; 2.5h; 8.2a,d

(a) Establish minimum entry requirements for new entrants at the fishing business level (i.e. taking into account entitlements held in other fisheries) to prevent increases in effort by small businesses.

Background: Similar to how the Recognised Fishing Operation (RFO) policy and the transfer policy work, safeguards are needed to ensure that new entrants to the fishery replace active fishing effort before they can operate.

Operators need to be in a position, by 2008, to afford to pay for the attributable costs of management from their fishing revenue. Viable fishing businesses also have a greater incentive to support long term management decisions that are needed now and into the future.

It is the Government's intention to encourage a full time professional fishing industry.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	By July 2003	NSW Fisheries	Regulatory

(b) Implement restrictions on the renewal of Ocean Hauling endorsements for the non-payment of annual Ocean Hauling endorsement fees.

Background: The Ocean Hauling MAC recommended in 2000 that any commercial fisher who has not renewed their ocean hauling endorsement for two years be advised that they will no

longer be permitted to conduct ocean hauling activities. This arrangement will be continued in the share management plan.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	By July 2004	NSW Fisheries	Policy & Regulatory

(c) Continue with transfer guidelines that ensure the allocation of ocean hauling endorsements to new business owners, only where that business previously held the relevant endorsement and holds the minimum level of catch and participation required to replace historical participation rather than activate latent effort.

Background: Ocean hauling transfer rules were implemented in April 2000 to replace the restrictive transferability policy in place since the fishery was restricted in 1995.

The restrictive transfer policies are necessary to prevent endorsements which were granted under lower entry criteria being issued to new owners and utilised at much higher levels. The new transfer guidelines provide greater flexibility to the fishery, however, restrict access upon transfer to those businesses that demonstrate sufficient levels of historic participation to minimise any potential increase in effort.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	Ongoing	NSW Fisheries	Policy

Objective 2.4 To minimise the impact of activities external to the Ocean Hauling Fishery on the resources harvested by the fishery and on fishery related habitats

Other important responses: 1.2a; 1.3d; 1.4a; 2.1d; 2.2h

(a) NSW Fisheries and commercial fishers will contribute to the development of policies or legislation established by the NSW Government to ensure that fish stock and habitat issues (including beach habitat) are properly considered in other environmental planning regimes.

Background: NSW Fisheries and fisheries stakeholders are already represented on many natural resource management committees that operate across the State (e.g. Catchment Management Boards, Healthy Rivers Commission, Coastal Council of NSW, etc.).

Contributing to Goals	Timeframe	Responsibility	Authority
1,6,7	Current & ongoing	NSW Fisheries OH fishers	-

(b) The Ocean Hauling MAC will consider the impacts of activities external to the fishery on the resource and bring any detrimental impacts to the attention of NSW Fisheries and/or the relevant managing authority.

Contributing to Goals	Timeframe	Responsibility	Authority
1,5,6,7	Current & ongoing	OH MAC	-

(c) NSW Fisheries will continue to review and, where legislatively enforceable under the *Fisheries Management Act 1994*, place conditions on development applications referred to it by other

determining authorities, in order to avoid or minimise impacts on fishery resources from coastal developments.

Background: Development applications submitted under the Environmental Planning and Assessment Act 1979 *that have the potential to adversely impact on fish or fish habitat are often referred to NSW Fisheries for review and comment. Using it's legislative powers under the* Fisheries Management Act 1994*, the Department has the ability to recommend the refusal of the development (if inconsistent with the Act or Policy and Guidelines for Aquatic Habitat Management and Fish Conservation 1999), recommend the approval of the development without changes, or in some circumstances, recommend the approval of the development with conditions to be attached to limit the potential impacts of the activity. Where issues do not fall within the legislative jurisdiction of the department, NSW Fisheries may still provide advice to the relevant determining authority to ensure that these issues are considered and appropriately addressed.*

Contributing to Goals	Timeframe	Responsibility	Authority
1,7	Current & ongoing	NSW Fisheries	EP&A Act

Objective 2.5 To promote the recovery of overfished species

Other important responses: 1.1d; 2.1a–e; 2.2c,h;

Background: The process of determination of a species status is described in section 6(e)(iv) of this Chapter. This process may commence with a trigger point review (explained in section 5 in this Chapter. It is important to note that an indicator for a species that has exceeded its trigger point does not automatically mean that species is overfished. Trigger points are set conservatively, (that is, they are likely to trigger "false alarms") in order to maximise the chance of detecting a genuine event of importance (see section 5(a) in this Chapter).

(a) For species where the fishery is a major harvester, develop and implement a recovery program for the species which includes specified timeframes for action.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,6	Recovery program drafted for consultation within 6 months	NSW Fisheries OH MAC	To be determined

(b) For species where the fishery is a minor harvester, contribute to the development of a recovery program for the species and adopt any measures required by that program.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5,6	As required	NSW Fisheries	Various

(c) While no recovery program is in place for a species that has been determined as being recruitment overfished, implement precautionary actions including but not limited to:

- total harvest controls
- reductions in effort associated with the harvest of the species
- the implementation of fishing closures

- bycatch management provisions
- mandatory gear changes.

Background: In the event that a species is determined to be recruitment overfished urgent action is needed to prevent the risk of a stock collapse. Growth overfishing on the other hand relates to maximising the yield from the stock and does not necessarily require immediate measures prior to the introduction of a recovery program.

Contributing to Goals	Timeframe	Responsibility	Authority
1,5,6	As required	NSW Fisheries	Various

(d) commence consultation with all harvesters of silver trevally over the development of a recovery program for that species, in particular consider the introduction of an appropriate size limit to address the problem of growth overfishing.

Background: Silver trevally is growth overfished and landings of this increasingly valuable species have declined in NSW waters over the last 15 years. Silver trevally have been an important target species at some times in the Ocean Hauling Fishery, particularly for purse seine fishers. In the last ten years, trevally catches in this fishery have not been large, however, in the mid-1980s, purse seine catches of silver trevally were large and catches of those levels are likely to be a risk to the stock.

Contributing to Goals	Timeframe	Responsibility	Authority
6	Immediate	NSW Fisheries OH MAC	-

Objective 2.5.1 As the major harvester of sea garfish, to implement actions to commence the development of a recovery program

(e) Discuss as soon as possible with the Estuary General MAC and industry to:

- remove the method of garfish bullringing from the Ocean Hauling Fishery
- constrain garfish bullringing to estuaries only
- remove the garfish hauling method from the Estuary General Fishery
- commence discussion with the Estuary General MAC over more appropriate definitions of the waters where these methods can be applied.

Background: The Ocean Hauling MAC has made clear its view that, as a meshing method, garfish bullringing should not take place as part of the Ocean Hauling Fishery or in ocean waters. Similarly, the Estuary General MAC has expressed reserve about the use of garfish hauling nets in that fishery. This change will effectively restrict targeting of sea garfish with the bullringing net because of the distribution of that species. The garfish hauling net and the garfish bullringing net have associated definitions of waters that may not be appropriate given the intent of the discussions mentioned above.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	By July 2004	NSW Fisheries OH MAC EG MAC	Regulatory

(f) Continue the zoning scheme in the hauling sectors of the Ocean Hauling Fishery which includes all class A and B entitlement holders, both beach and boat-based sectors, which restricts fishers to operating in a single nominated zone.

Background: A zoning scheme was implemented in the beach hauling sector of the Ocean Hauling Fishery upon restricting access to the fishery in 1995. Zoning rules limit a fisher's operation to one of seven regions along the NSW coastline. The zoning scheme was introduced to alleviate conflict among commercial fishers and between commercial fishers and other resource user groups. The major source of conflict was from fishers travelling to other areas. The current zoning structure has resulted in a significant reduction in conflict.

Some boat-based garfish haulers are currently permitted to operate in more than one ocean hauling region to catch garfish. In recent years, the inconsistency of zoning rules between beach and boat-based haulers has been a concern to many fishers and the Ocean Hauling MAC. Following reports of conflict and considerable discussion, the Ocean Hauling MAC has recommended that boat-based haulers with multi-region access be restricted to a single region.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	Ongoing	NSW Fisheries	Regulatory

(g) Monitor the impact of the zoning of boat-based garfish hauling on the harvest of the sea garfish stock. Should the zoning of boat-based garfish hauling not have an immediate impact on landings of sea garfish (i.e. no reduction in landings by businesses that normally worked in multiple regions), implement a seasonal closure on sea garfish that will promote recovery of the species.

Background: The implementation of zoning for garfish operators is expected to reduce fishing effort on that stock. The Ocean Hauling MAC has suggested that the expected decrease in fishing effort should be about 40%. The Ocean Hauling MAC has indicated that if the zoning does not have the expected effect, a partial closure of the fishery would be the next step considered to protect sea garfish (until minimum shareholdings are available to control effort).

Contributing to Goals	Timeframe	Responsibility	Authority
8	From July 2002	NSW Fisheries	-

(h) Identify the level of active effort for the garfish hauling net and implement appropriate minimum shareholdings immediately that will lead to the recovery of sea garfish.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4,5	By July 2004	NSW Fisheries	Regulatory

(i) Remove the concession to use 25 mm mesh in the garfish hauling net.

Background: See section 3 in Chapter B.

Contributing to Goals	Timeframe	Responsibility	Authority
1,5	July 2002	NSW Fisheries	Policy

(j) Extend the November-February weekend closure on hauling to a year-round closure for all garfish hauling.

Background: In August 2001, the Ocean Hauling MAC agreed that the closure on beach hauling could be extended to a year-round weekend closure for both beach and boat-based garfish hauling.

Contributing to Goals	Timeframe	Responsibility	Authority
1,4	July 2002	NSW Fisheries	Regulatory

Objective 2.5.2 To actively promote research programs that will improve stock assessment of sea garfish

(k) Describe the retention and rate of meshing by size for sea garfish in 28 mm and test appropriate larger mesh sizes in garfish hauling nets.

Background: Commercial landings of sea garfish in NSW have declined in recent years. Various management options, including mesh size regulations are being considered by the Ocean Hauling MAC to help arrest this decline. This research is planned to help examine the impacts of using 28 mm mesh in garfish hauling nets and to provide the background needed to support (or not) a decision to move to a mesh size in the garfish hauling net larger than the current 28 mm. This decision should be made in light of information on both selectivity and rate of meshing of garfish in any proposed mesh for a hauling net.

Contributing to Goals	Timeframe	Responsibility	Authority
7,8	By July 2003	NSW Fisheries	-

(l) Continue existing programs on garfish assessment and monitoring and where appropriate make grant applications to expand those programs.

Background: See summary in Appendix B1. Sea garfish are most likely to have been overfished and are being caught at levels which are generally the lowest in recent decades. There is an urgent need to improve biological knowledge of, and the stock assessment for, this species to ensure appropriate management settings. A two year study, funded by FRDC, University of Wollongong and NSW Fisheries, commenced in December 2001. The study will provide, among other things, age and growth estimates of sea garfish that will be of great value in assessing the stock status of that species.

Contributing to Goals	Timeframe	Responsibility	Authority
7,8	Ongoing	NSW Fisheries	-

GOAL 3 To promote the conservation of threatened species, populations and ecological communities associated with the operation of the Ocean Hauling Fishery

Objective 3.1 **To eliminate and/or minimise any impact of fishing activities in the fishery on threatened species, populations and ecological communities (including mammals, birds, reptiles, amphibians, fish, invertebrates and vegetation), and where possible promote their recovery**

Other important responses: 1.1a,c; 1.2b; 1.3c,d; 4.5b,c; 6.4a; 8.2a

(a) Modify the catch and effort returns, in consultation with Ocean Hauling MAC, to collect and monitor information on sightings or captures of threatened species.

Background: The guidelines for a "ecologically sustainable" fishery approved by the Commonwealth under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 *include a requirement to collect information on interactions with endangered, threatened or protected species and threatened ecological communities. These species, populations and communities are listed in the* Fisheries Management (FM) Act 1994, Threatened Species Conservation Act 1995 *and the EPBC Act.*

Contributing to Goals	Timeframe	Responsibility	Authority
6,7,8	Immediate	NSW Fisheries OH MAC	-

(b) Implement, in consultation with the Ocean Hauling MAC, the provisions of any relevant threatened species recovery plans or threat abatement plans.

Background: An example of this may be to manage the harvest of baitfish in known ocean waters baitfish grounds to ensure an ongoing food supply for the fairy penguin/any threatened species populations identified as relying on these grounds for food supply.

Contributing to Goals	Timeframe	Responsibility	Authority
4	Current & ongoing	NSW Fisheries	FM Act

(c) Continue the prohibition on taking protected fish and on fish protected from commercial fishing as set out in the FM Act and *Fisheries Management (General) Regulation 1995.*

Background: 'Protected fish' refers to species of fish that are protected from all forms of fishing. 'Fish protected from commercial fishing' as the name suggests, refers to species of fish that are protected from commercial fishing only. Protected fish includes those species identified as threatened, endangered or vulnerable under the Fisheries Management Act 1994.

At the commencement of this draft FMS, the marine and estuarine species of protected fish included Ballina angelfish, black rock cod, great white shark, eastern blue devil fish, elegant wrasse, estuary cod, giant Queensland groper, grey nurse shark, Herbsts nurse shark, weedy seadragon, great white shark and green sawfish.

Fish protected from commercial fishing included marlin (black, blue and striped), groper (blue, brown and red), Australian bass and estuary perch.

Contributing to Goals	Timeframe	Responsibility	Authority
4	Current & ongoing	NSW Fisheries	FM Act

(d) Continue the prohibition of taking any species in commercial fishing operations protected under other jurisdictions' arrangements (this may include invertebrates, fish, reptiles, birds, mammals, plants, algae etc)**.**

Background: Protected species are identified under the NSW Threatened Species Conservation Act 1995*, the NSW* National Parks and Wildlife Act 1974*, the Commonwealth* Environmental Protection and Biodiversity Conservation Act 1999.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	As required	NSW Fisheries	Various

GOAL 4. To appropriately share the resource and carry out fishing in a manner that minimises social impacts

Objective 4.1 **To monitor and provide an appropriate allocation of the fisheries resource between fishing sector groups, acknowledging the need of seafood consumers to access fresh quality fish**

Other important responses: 1.1d; 2.1a-d; 2.2a-f,h; 2.3a; 2.5a,b; 4.2a; 4.3a; 4.5a,c,d; 5.2d; 6.3c; 8.1b,c; 8.2a,c

(a) Estimate, as far as practicable, the size of the non-commercial catch, and the relative impact of such harvesting on the resource, taking into account the results of the National Recreational and Indigenous Fishing Survey.

Background: Results from this survey should be available in early 2002. Any estimates of illegal catch includes any 'black market' catch sold by licensed commercial fishers or unlicensed fishers. Estimates of all harvest rates are vital for stock assessments.

Contributing to Goals	Timeframe	Responsibility	Authority
2,8	By July 2004	NSW Fisheries	-

(b) Continue the requirement that species landed in this fishery are not landed in contravention of any maximum daily catch or 'trip' limit that may apply to particular species.

Background: At the time of drafting this proposed FMS, a daily catch limit applied to two species taken by nets in the Ocean Hauling Fishery. A limit of 100 kg per day per hauling crew, 50 kg per meshing crew (or individual) and 50 kg for any other licensed commercial fishing vessel containing a commercial fishing net applies for Australian salmon north of Barrenjoey Headland and tailor taken in all NSW waters.

Contributing to Goals	Timeframe	Responsibility	Authority
2	Current & ongoing	NSW Fisheries	Various

Objective 4.2 **To monitor and manage a fair and equitable sharing of the fisheries resource among commercial fisheries**

Other important responses: 1.1d; 1.3a; 2.1a-d; 2.2a-f,h; 2.5a,b,e; 4.1b; 4.5a; 5.2d; 8.1b,c; 8.2a,c

(a) Monitor catch levels and management structure in fisheries that are outside NSW jurisdiction but where catches in those fisheries impact on stocks shared with the Ocean Hauling Fishery.

Background: The Ocean Hauling Fishery shares many resources with other fisheries across jurisdictional boundaries. Examples include the Commonwealth's Small Pelagic Fishery (SPF) and South East Non-trawl Fishery (SENTF), the sea mullet fishery in Queensland and the fishery for Australian salmon in Victoria.

This draft FMS must provide for regular updates on catch and changes in management or catch composition in these other fisheries. Where possible, it is important to have consistent or complimentary management arrangements for shared stocks, between jurisdictions.

Contributing to Goals	Timeframe	Responsibility	Authority
2,8	Annually	NSW Fisheries	-

(b) Monitor the catch of the target ocean hauling species that are also taken in other NSW fisheries (i.e. Estuary General, Ocean Trap and Line)

Contributing to Goals	Timeframe	Responsibility	Authority
2,8	Annually	NSW Fisheries	-

Objective 4.3 To monitor and manage a fair and equitable sharing of the fisheries resource within the Ocean Hauling Fishery

Other important responses: 1.1d; 1.3a; 2.1a-d; 2.2a-h; 2.3b; 2.5a,b,e,f,h; 5.2d; 8.1a-c; 8.2a,c,d

(a) Include in the shareholding scheme a maximum shareholding that sets a maximum level of effective control of fishing access within each region or method by any single individual or entity.

Background: Implementation of share trading schemes can lead to reducing the control of access rights to a small number of businesses if not limited.

The Ocean Hauling MAC have initiated discussions on this issue highlighting concern that some smaller fishing businesses are being purchased by entities who may own several fishing businesses. These companies then nominate fishers to work the businesses.

Contributing to Goals	Timeframe	Responsibility	Authority
5	By July 2004	NSW Fisheries	-

Objective 4.4 To minimise any negative impacts of the Ocean Hauling Fishery on Aboriginal or other cultural heritage

Also see response: 4.1a; 6.4a

(a) Participate in the development and subsequent reviews of the Indigenous Fisheries Strategy and make adjustments to the Ocean Hauling FMS where needed.

Background: The State Government is currently developing the first Indigenous Fisheries Strategy for NSW and the Ocean Hauling MAC has already examined and provided comments on the issues paper.

Contributing to Goals	Timeframe	Responsibility	Authority
6	Current & ongoing	OH MAC	To be determined

(b) Respond, wherever practicable, to new information about areas or objects of cultural significance in order to minimise the risk from fishing or fishing activities.

Background: The Ocean Hauling Fishery must respond appropriately to new information about items or locations of cultural significance (e.g. a recently uncovered shipwreck). The NSW NPWS is the authority determining items of cultural significance.

Contributing to Goals	Timeframe	Responsibility	Authority
	Immediate	NSW Fisheries OH Fishers	-

Objective 4.5 To promote harmony between the commercial fishery and other resource users, including recreational fishers, Indigenous fishers and local communities, through fair and equitable sharing of the fisheries resource

Other important responses: 1.1a-e; 1.2b,c; 1.3d; 2.1c,d; 2.2a,e-h; 2.5d,e,j; 3.1c,d; 4.1a,b; 4.3a, 4.4a; 6.1b; 6.3b; 6.4a; 7.1a-d; 7.2a; 8.2a,b

(a) [Continue to] use fishing closures to control the area and time fished to:

- protect key fish habitat, such as total beach closures
- reduce bycatch in places or at times when the amount of bycatch is unacceptable
- avoid direct interactions with marine and terrestrial threatened species, populations or ecological communities
- equitably share the resource between ocean hauling fishers and other stakeholders (including through the regional liaison process)
- minimise impact on nesting and/or feeding areas of migratory birds
- minimise impact on sensitive ocean beach habitat.

Background: Fishing closures prohibit fishing over an area either absolutely or conditionally. These closures can be implemented under section 8 of the FM Act or by the Regulation.

Fishing closures already exist that impact on the Ocean Hauling Fishery for a range of reasons. Each closure generally has benefits to numerous aspects of the resource and the fishery. Existing closures cover about 6% of the beach otherwise available to the ocean hauling beach sector.

Fishing closures can be gear specific so that only the relevant gear types are affected by such a closure. Closures are periodically reviewed and modified to take account of changing fishing patterns and/or environmental conditions.

The regional liaison process were established in 1995 for five of the seven ocean hauling regions to address many of the issues related with the Ocean Hauling Fishery (particularly the beach-based sector) at a local level. The consultative process aimed to ensure social sustainability for the fishery. Committees contained representatives from recreational fisheries, local councils, National Parks and Wildlife Service and a variety of community groups. Traditional hauling grounds and ocean hauling beach closures, specified access beach access points, agreed local target species and local amendments to the ocean hauling code of conduct were proposed by each committee under this process.

The Ocean Hauling MAC strongly supported the outcomes of the regional liaison process and seeks to have them reviewed and where possible, implemented as part of this draft FMS. This

proposal dramatically increases the area of beach in NSW that is temporarily or permanently closed to the Ocean Hauling Fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,6	Current & ongoing regional liaison process by July 2004	NSW Fisheries	Regulatory

(b) Review in consultation with the Ocean Hauling MAC on an annual basis the established code of conduct, enforceable by conditions on licence, for the beach hauling sector of the fishery, which outlines rules for:

- operating on beaches that minimise environmental impacts in those areas
- operating in the vicinity of areas used by recreational fishers
- the use of gear and the behaviour of commercial fishers
- the appropriate handling methods for incidental catches of marine birds or mammals
- encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken
- locally negotiated access and beach conduct rules.

Background: A code of conduct is in place for the beach sector of the Ocean Hauling Fishery which sets standards for the manner in which fishers operate. A code of conduct which has the support of surrounding communities goes a long way to improving the relations between the commercial fishing industry and other stakeholders. This code is under regular review by NSW Fisheries and the Ocean Hauling MAC.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,5,6,7	Annual	NSW Fisheries OH MAC	Regulatory

(c) Develop a code of conduct in consultation with the Ocean Hauling MAC, to be enforceable by conditions on licence, for the purse seine sector of the fishery and with respect to:

- operating in the vicinity of areas used by recreational fishers or grounds subject to intense recreational bait gathering
- the appropriate handling methods for incidental catches of marine birds or mammals
- the use of gear and the behaviour of commercial fishers
- encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken.

Background: Purse seine fishing is not dealt with specifically in the existing code. A new code for purse seine fishers would need to include any issues that might bear specifically on the Commonwealth tuna fishers who hold permits under section 37 of the FM Act to gather bait using purse seines.

For example, the code of conduct might consider voluntary closures on weekend fishing for bait at popular recreational bait grounds. The code could also consider advice for best practice on releasing incidental catches of marine birds or mammals.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,5,6,7	Annual	NSW Fisheries OH MAC	Regulatory

(d) Consult with the community on proposals for recognised fishing grounds, in accordance with the guidelines approved by the Minister, over historical hauling sites.

Background: Recognised fishing grounds determine the rights of priority for certain methods between commercial fishers and other beach users in specified areas. They do not prevent local Councils from approving applications for development in or over those areas, but they can be useful in highlighting areas of importance to commercial fishing. The regional liaison process was established in 1995 have taken initial steps in identifying traditional hauling grounds in each ocean hauling region. Further information on recognised fishing grounds is provided in section 6(i)(xv) of this chapter.

Contributing to Goals	Timeframe	Responsibility	Authority
5,6	By July 2005	NSW Fisheries OH MAC	Regulatory

GOAL 5. To promote a viable commercial fishery (consistent with ecological sustainability)

Objective 5.1 To optimise the biological yield of fish taken within the fishery where appropriate to maximise economic return

Other important responses: 2.1a–d; 2.2c; 2.5a-c,i; 4.1a; 8.1b,c

(a) Provide for the continued taking of target species that become subject to minimum legal length regulations, subject to appropriate management of bycatch issues created by the length restriction.

Background: Some ocean hauling methods are prohibited from taking any fish that has a prohibited size classification (usually a minimum legal length). Species currently targeted by these methods may have legal minimum length restrictions imposed at some future date in order to improve yield or for other reasons. The intent of a size limit would not be to stop access to the species, but to force all catching sectors to sustainably harvest subject to a length limit.

The Ocean Hauling Fishery would need to demonstrate that any bycatch issues arising from a new size limit can be managed sustainably.

Contributing to Goals	Timeframe	Responsibility	Authority
	July 2003	NSW Fisheries OH MAC	Regulatory

Objective 5.2 To promote the long term economic viability of ocean hauling

Other important responses: 2.2d,e–h; 2.3a,b; 2.5a,h,i; 4.1a; 4.3a; 4.5b,c; 5.3a; 6.3c

(a) Determine if there is a means by which purse seine fishers could keep small quantities of their catch alive in holding pens for short periods, while meeting the legislative and policy requirements of NSW Fisheries and other stakeholder groups or agencies.

Background: Under the Fisheries Management Act 1994 *fish penning is currently considered an aquaculture activity, which requires an aquaculture permit. Fish pens have advantages for commercial fishers in that product can be kept alive and filtered into the markets over time, achieving improved prices.*

However, there are potential risks of pens that need to be managed, including the stimulation of disease due to the confinement of large numbers of fish in small cages, increased nutrient loading into the surrounding environment if the fish are. The fishery will need to adopt best practice models for cage design and site selection for this to be viable.

Contributing to Goals	Timeframe	Responsibility	Authority
	By July 2006	NSW Fisheries	Regulatory

(b) NSW Fisheries will develop, in consultation with the Ocean Hauling MAC, a performance measure for economic viability at both individual fishing business and fishery wide levels.

Contributing to Goals	Timeframe	Responsibility	Authority
7	By July 2005	NSW Fisheries OH MAC	-

(c) NSW Fisheries will develop, in consultation with the Advisory Council on Commercial Fishing, a cost recovery framework.

Background: On 2 November 2000, the Government announced that over the succeeding five years NSW Fisheries would develop and implement a fair and transparent cost recovery framework for category 2 share management fisheries. During this period, the total amount of money collected by NSW Fisheries, for its existing management services, will not increase without the support of the relevant management advisory committee. A cost recovery framework needs to be developed in order that fishers pay according to their level of access in the fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
6	By November 2005	NSW Fisheries ACCF	Ministerial determination

(d) NSW Fisheries will develop, in consultation with the Ocean Hauling MAC, a system to provide for appropriate new additions to the lists of target species for each of the ocean hauling methods. The system should also provide for assessment of proposed changes to the application of fishing methods (or new methods).

Background: With the commencement of this draft FMS, each of the ocean hauling methods will have a designated list of species that may be targeted. The proposed system needs to provide an appropriate assessment system to allow species to be added to the target list or new methods to be activated, taking into account the impact on:

(1) sustainability

(2) habitat

(3) other resource users.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,6	By December 2003	NSW Fisheries OH MAC	-

Objective 5.3 To provide secure fishing entitlements for ocean hauling fishers

Other important responses: 2.1b; 2.2d,h; 2.5b; 4.5d; 5.2d; 6.3c; 8.1b,c

(a) Implement the share management provisions of the *Fisheries Management Act 1994*.

Contributing to Goals	Timeframe	Responsibility	Authority
6	By July 2003	NSW Fisheries	FM Act

Objective 5.4 To appropriately manage food safety risks in the harvesting of fish in the fishery

Other important responses: 2.4b; 4.5b,c; 6.1d; 6.4a

(a) Co-operate with SafeFood Production NSW in the development and implementation of food safety programs relevant to the fishery.

Background: SafeFood Production NSW is currently in the process of developing food safety plans for harvest and post-harvest seafood industry, and the plans may impose statutory requirements on fishers to comply with the approved standards. Supporting food safety programs is a responsible way of promoting consumer confidence in fish products harvested by the fishery and protecting viability of the industry.

Contributing to Goals	Timeframe	Responsibility	Authority
6	Current & ongoing	OH Fishers	FP Act

(b) Continue the prohibition on the processing or mutilation of fish taken in the fishery on or adjacent to water.

Contributing to Goals	Timeframe	Responsibility	Authority
2,6	Current & ongoing	NSW Fisheries	Regulatory

GOAL 6. To ensure cost-effective and efficient ocean hauling management and compliance programs

Objective 6.1 To maximise compliance with the Ocean Hauling FMS

Other important responses: 2.1c; 2.2b,f,h; 2.5e,f; 4.5a,b,d; 5.3a; 5.4b; 6.2a; 6.3a; 7.1a,b,c,d; 8.2b,c,d

(a) Develop, implement and monitor, in consultation with the Ocean Hauling MAC, fishery compliance operational plans and encourage voluntary compliance through educational programs.

Background: NSW Fisheries already develops and implements operational plans for compliance.

Contributing to Goals	Timeframe	Responsibility	Authority
2	By July 2004	NSW Fisheries OH MAC	Policy

(b) Implement an endorsement suspension scheme and share forfeiture scheme based on a demerit point scale for serious offences and habitual offenders.

Note: "serious offences" need to be defined and could include offences such as interfering with fishing gear, offences carrying serious consequences, etc.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	By July 2003	NSW Fisheries	Regulatory & Policy

(c) Publish successful prosecution results for nominated offences in relevant publications and media to discourage illegal activity.

Contributing to Goals	Timeframe	Responsibility	Authority
7	Ongoing from 2003	NSW Fisheries	-

(d) Continue the requirement that fish taken in the fishery are marketed through a registered fish receiver (RFR) or a restricted registered fish receiver (RRFR) as outlined in the Regulation.

Contributing to Goals	Timeframe	Responsibility	Authority
5,8	Current & ongoing	NSW Fisheries	Regulatory

Objective 6.2 To encourage cooperation between fishers and compliance officers in detecting offences

Other important responses: 2.2h; 5.3a; 6.1a; 6.3a; 7.1a-d

(a) Continue the requirement that fishers comply with directives given by Fisheries Officers, including to allow officers to board fishing boats to inspect catch, and to produce "authorities to fish" when requested.

Contributing to Goals	Timeframe	Responsibility	Authority
-	Current & ongoing	NSW Fisheries	FM Act

Objective 6.3 To provide effective and efficient communication and consultation mechanisms in relation to the Ocean Hauling Fishery

Other important responses: 1.3b,d; 2.4a,b; 2.5a,b,d,e; 4.4a; 4.5a,b; 5.2c,d; 5.3a; 6.1a,c; 7.1a-d; 7.2a; 8.1d; 8.2b,c

(a) Continue to recognise the Ocean Hauling MAC as the primary consultative body for issues affecting the fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
-	Current & ongoing	NSW Fisheries	Policy

(b) Continue to use the services of a chairperson in the Ocean Hauling MAC who is not engaged in the administration of the *Fisheries Management Act 1994* nor engaged in commercial fishing.

Contributing to Goals	Timeframe	Responsibility	Authority
4	Current & ongoing	NSW Fisheries	FM Act

(c) Monitor, in consultation with the Ocean Hauling MAC, access restrictions from other jurisdictions (parks, councils).

Background: Fishers have expressed concern over their access to beaches that are not managed by NSW Fisheries. The Ocean Hauling MAC has undertaken discussions over the access to intertidal areas by management authorities such as the National Parks and Wildlife Service (NPWS). Currently, ocean hauling fishers apply for permits for access through National Parks, and NPWS have gazetted plans of management to control activities to the mean low water mark. NSW Fisheries is generally consulted by NPWS in areas where jurisdictional overlaps occur.

Consultation with local councils over beach access is also proposed. This strategy must take account of the impact on the fishery of all effective closures, whether or not they are part of this draft FMS.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5	Annual review	NSW Fisheries	-

Objective 6.4 **To implement this FMS in a manner consistent with related Commonwealth and State endorsed programs aimed at protecting aquatic environments, and achieving the objects of the Act and the principles of ecological sustainable development**

Other important responses: 1.2a; 1.3c,d; 1.4a; 2.2h; 2.5a–c; 3.1a,b,d; 4.4a

(a) Manage the Ocean Hauling Fishery consistently with other jurisdictional or natural resource management requirements, such as the marine parks program, aquatic biodiversity strategy, threatened species program and others.

Background: This draft FMS will be operating alongside other programs relating to the management of marine resources, and must be consistent with those programs. The FMS must be adaptive and able to be modified if inconsistencies between the programs become apparent.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,4,5	Current & ongoing	NSW Fisheries	Policy

(b) Provide for the issue of permits under section 37 of the *Fisheries Management Act 1994* authorising modified fishing practices to assist research programs or for purposes consistent with the vision and goals of this draft FMS.

Background: Permits are required to use gear in a manner that is different to that specified in Appendix C1. The techniques required to investigate new approaches to using fishing gear may require formal approval. Such approval is also commonly given to industry members who are assisting with research to provide a formal exemption from prosecution.

Contributing to Goals	Timeframe	Responsibility	Authority
8	Current & ongoing	NSW Fisheries	FM Act

GOAL 7. To improve public understanding of the fishery and of the resources upon which the fishery relies

Objective 7.1 To improve the community understanding and public perception of commercial ocean hauling fishing

Other important responses: 1.1a; 1.2a; 1.3d; 2.1a,b; 2.2e,f; 2.4a-c; 2.5k,l; 3.1a; 4.5b,c; 5.2b; 6.1c; 7.2a; 8.1a-d; 8.2a,c-e

(a) Develop and implement an education strategy for fishers and NSW Fisheries contact officers.

Background: Fishers and NSW Fisheries contact officers should have current and complete information about the range of management controls and policies that control the Ocean Hauling Fishery. Those groups also need to understand the long-term objectives for the fishery and how industry and NSW Fisheries are working toward those objectives. The end users of this education strategy must be involved in its development in order to ensure it meets their needs.

Note: This draft FMS could be expanded to comprise all education aspects of management of this fishery. Such a strategy would include the details for things like how catch statistics are compiled and published, how management advisory committee minutes are to be made public, and how results from research programs on the fishery are to be extended to industry and the community.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	By July 2003	NSW Fisheries	-

(b) Make the Fishery Management Strategy, Environmental Impact Statement and other relevant documentation widely available to the public by:

- placing them on the NSW Fisheries website
- providing copies at Fisheries Offices throughout the State
- targeted mail outs to key stakeholders.

Background: This would also include key public documents relevant to the performance review of the final FMS, such as reviews arising from exceeded trigger points.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	Ongoing	NSW Fisheries	-

(c) Produce or contribute to the production of brochures, newsletters, signs and undertake targeted advisory and educational programs, as required.

Background: The diverse nature of stakeholders in the Ocean Hauling Fishery means careful consideration must be given to the appropriate forms of communication to make certain all stakeholders receive appropriate information.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	Ongoing	NSW Fisheries	-

(d) Respond to inquiries by industry or the public with respect to the final FMS or the fishery generally.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6,8	Current & ongoing	NSW Fisheries	-

Objective 7.2 To promote community awareness of the importance of fish habitat to fish stocks

Other important responses: 1.2a; 2.1b; 2.4a-c; 7.1b; 8.1b,c

(a) Publish educational information concerning the protection of fish habitat (including the benefits of aquatic reserves) on the NSW Fisheries website and in other relevant publications and media.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	Current & ongoing	NSW Fisheries	-

GOAL 8. To improve knowledge of the Ocean Hauling Fishery and the resources upon which the fishery relies

Objective 8.1 To promote appropriate scientific research and monitoring to gain knowledge of target speciesand bycatch

Other important responses: 1.1a; 1.3b,c; 2.1a,b,e; 2.2e,f; 2.5g,k,l; 3.1a; 4.1a; 4.2a,b; 6.4b; 7.1d; 8.2a-e

(a) Monitor all species and quantity of catches taken by each net type (and where appropriate, within each region) used in the Ocean Hauling Fishery.

Background: The structure of the current catch return, although in need of revision, provides for ocean hauling catches to be recorded under each net authority available in the Ocean Hauling Fishery. Catches recorded by net type provide understanding about changes in targeting practices or other changes in the relationship between methods and gear.

Contributing to Goals	Timeframe	Responsibility	Authority
4,7	Annual review	NSW Fisheries	-

(b) Continue with annual stock assessment and monitoring of sea mullet in NSW.

Background: A three year project completed in 1997 provided the first detailed study of the biology and fishery for sea mullet since the 1950's. Annual monitoring age/size composition of the ocean and estuarine commercial catches have continued since 1997. This is an ongoing program that is developing a detailed assessment of the status of the sea mullet resource in order to provide advice to in relation to the management of the fishery on a sustainable basis.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,7	Current & ongoing	NSW Fisheries	-

(c) Continue with annual stock assessment and monitoring of yellowfin bream in NSW.

Background: A continual program is in place that assesses the size composition, effort trends and derives the age composition of ocean and estuarine catches of yellowfin bream in NSW. The information contributes to developing a conceptual model and a preliminary simulation model of the bream stock in NSW.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,7	Current & ongoing	NSW Fisheries	-

(d) Determine, in consultation with stakeholder groups identified by NSW Fisheries, the priorities for research for the fishery, taking into account the research needs identified in this FMS, in the EIS or arising out of new research results.

Background: NSW Fisheries has commenced consultation with a broad range of stakeholder groups over the development of research priorities relating to the State's fisheries resources,

including the Ocean Hauling Fishery. This is done primarily through the NSW Fisheries Research Advisory Committee (FRAC), which advises funding agencies on fisheries research priorities for the State. Further information on the role of FRAC can be found on the NSW Fisheries website at: www.fisheries.nsw.gov.au. The process will need to incorporate feedback from the stakeholder groups on the research needs identified in this draft FMS. The priority setting process will identify the research priorities (including priorities for stock assessments) for the Ocean Hauling Fishery by June 2002 and will be done annually thereafter. It is also critically important to provide feedback from new research programs, such as the observer study, into this priority setting framework.

Contributing to Goals	Timeframe	Responsibility	Authority
6,7	Ongoing	NSW Fisheries	-

(e) Allocate research resources and where appropriate make grant applications to support research relevant to the fishery in accordance with the priorities identified from the process described in management response 8.1(d).

Background: Research into the Ocean Hauling Fishery is currently funded through a combination of NSW Fisheries core expenditure and external grants from State and Commonwealth research and development programs.

Contributing to Goals	Timeframe	Responsibility	Authority
	Ongoing	NSW Fisheries	-

Objective 8.2 To improve the quality of the catch and effort information collected from endorsement holders

Other important responses: 1.1a; 1.3c; 2.1a,b; 2.2d-f; 3.1a; 6.1d; 8.1a-c

(a) Continue the requirement that every commercial fisher must make a record of all fish he or she has taken during each month, including the method/s used and send a copy to the Director of Fisheries within 28 days following the end of the month.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,7	Current & ongoing	NSW Fisheries	Regulatory

(b) Periodically review, in consultation with the Ocean Hauling MAC, the mandatory catch and effort return forms submitted by ocean hauling fishers and implement changes if:

- the data collected is perceived to be of poor quality or insufficient for the purpose of conducting an environmental or stock assessment, and/or
- the forms are found to be exceedingly complex for fishers to complete, ensuring an emphasis on the quality rather than quantity of information collected.

Background: NSW commercial fishers are required to report their landings to the Department. The records are a vital part of fisheries assessments and understanding the activities of fishers.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,6,7	Biannually from July 2004	NSW Fisheries	-

(c) Determine accuracy of current recording of species identification in catch records and provide advice to industry to make needed changes (may need to wait for results from observer study).

Background: Correct species identification is critical to many areas of the performance of this draft FMS. Most species in the fishery are clearly and easily identified and accurately reported. However, it is not unequivocally clear that terms like pilchard, sprat, anchovy and whitebait mean exactly the same thing to all fishers and that the common names relate in each case to a single species. The proposed observer study will be of great value in implementing this management response. Observers will provide first-hand information on what common names are used to identify what species and any patterns in the use of terms. This information will be used to make certain the industry advice and education is appropriately targeted.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,6,7	July 2004	NSW Fisheries	-

(d) Ensure that catch reporting in the Ocean Hauling Fishery accurately reflects the landings and, the composition and effort of the crew that made those landings. **In particular, use team-based, daily records for beach hauling during the mullet season.**

Background: Current practice in catch recording leaves open the possibility that some catch is recorded more than once. Crew composition may change within the monthly reporting period, making the bookkeeping associated with crew within hauling teams awkward on a monthly form. There will be sufficient accuracy and information gain to warrant a change in the recording for some hauling activities, particularly during the mullet season. Other changes should include reporting by region and beach instead of reporting by the latitude zones. For methods that may be beach or boat-based, the catch return should reflect which was used.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,6,7	Ongoing	NSW Fisheries	-

(e) Provide means by which ocean hauling teams can report fish observed but not caught.

Background: Beach haul teams routinely place an observer (spotter) at an elevated location in order to inform the team of the size and composition of schools of fish that are approaching the area where the team is waiting. Many of these schools are not the species sought or are too small to be worthwhile. Alternately, spotters may have indicated that a larger aggregation of fish is approaching and the team may want to wait for that. The relationship between what is spotted and what is captured may be a useful index of the rate at which fish escape the fishery, of species that could be affected by the fishery, and provide information for use in stock assessments.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,7	July 2003	NSW Fisheries	-

5. Performance Monitoring and Review

a) Performance monitoring

The complex nature of the Ocean Hauling Fishery means that many of the management responses assist in achieving multiple goals. Therefore, rather than examining the performance of each individual response or objective, it is more efficient and appropriate to measure the performance of the draft FMS against the eight goals (i.e. the major objectives). An annual report will, however, be prepared (as outlined later in this section) detailing the progress made in implementing the management responses.

i) Performance indicators

The performance indicators provide the most appropriate indication of whether the management goals are being attained. A number of monitoring programs are to be used to gather information to measure performance indicators. These monitoring programs are detailed later in this section in Table C11.

With the implementation of the new research proposals for the fishery outlined in section 6(g) of this draft FMS, a broader information base relating to the fishery and its impacts may allow for more precise performance indicators to be developed.

ii) Trigger points

The trigger points specify when a performance indicator has reached a level that suggests there is a problem with the fishery and a review is required.

Some performance indicators vary naturally from time to time and the trigger point levels chosen have been selected to be conservative in light of that natural change. That is, trigger levels are chosen to be well within the expected range of variation. This has the effect that the trigger will be exceeded more frequently because of natural variation in the performance indicator than because of a problem in the fishery. If the natural variation of the performance indicator is known, then the trigger level will be set such that the performance indicator must be outside the range in which 80% of observations fall to trigger a review.

Table C2 to Table C10 establish the performance indicators and trigger points that will be used to measure whether each of the management goals described in section 4 of this draft FMS are being attained.

b) Reporting on the performance of the FMS

A performance report assessing each performance indicator must be submitted to the Minister for Fisheries 12 months after the commencement of the FMS, and annually thereafter. The performance report is the formal mechanism for detecting when the performance indicators reach the trigger points.

The annual performance report will also review the progress made in implementing each of the management responses. Each performance report will be displayed on the NSW Fisheries web site.

The vast majority of management actions proposed in the draft FMS are linked to specified implementation timeframes. Some of these management actions are subject to specific trigger points

that ensure reviews and appropriate remedial actions if the target timeframes are not met. The progress of all other management actions will be monitored through the annual performance report.

If the performance report identifies that any specified target timeframe has not been met, a review will be undertaken and any necessary remedial measures recommended to the Minister.

A fishery will continue to be regarded as being managed within the terms of this FMS whilst any remedial measures associated with breaches in timeframes or triggering of performance indicators are being considered through the review process and/ or by the Minister for Fisheries.

c) Reviews arising from triggered performance indicators

i) The review process

If a performance indicator reaches the corresponding trigger point, the Minister for Fisheries will firstly consult with the relevant fishery's management advisory committee about the scope of the review and give notice of the impending review to the relevant Ministerial advisory councils. The notice will include a proposal about the scope of the review. This advice should include information such as the extent to which the trigger point was breached, the stakeholder groups that should be involved and any specific issues that might need to be examined during the review to determine the suspected reasons for the change. The Minister, having given the MAC and the relevant Ministerial advisory councils an opportunity to comment on the proposal, will then determine the scope of the review.

If the performance indicator and trigger point relates to a species that is caught in more than one fishery, the Minister may determine that the review should involve representatives from those other fisheries.

Reviews arising from landings exceeding trigger points should consider (but not be limited to) the following factors:

- changes in the relative catch levels among harvest sectors (including those beyond NSW jurisdiction)
- new biological or stock information (from any source) available since the most recent review of the species
- changes in the activities or effectiveness of fishing businesses targeting the species
- changes in principal markets or prices for the species.

ii) The review report

A report on the review must be forwarded to the Minister for Fisheries within three months of the trigger point breach being detected. The report must include appropriate recommendations for remedial action. All review reports will be publicly available.

A review report should indicate whether the suspected reasons for the trigger point being reached are the result of a fishery effect or an influence external to the fishery, or both.

iii) Review outcomes

If a review concludes that the reasons for the trigger point being breached are considered to be due to the operation of the fishery, or if the fishery objectives are compromised if the fishery

continued to operate unchanged, management action should be taken to ensure that the performance indicator returns to within an acceptable range within a specified time period. The objective of any remedial action proposed would vary depending on the circumstances that have been identified as responsible for the trigger point being reached.

If a review considers that the management objectives or performance monitoring provisions are inappropriate and need to be modified, the strategy itself may be amended by the Minister for Fisheries. If the reasons are considered to be due to the impacts on the resource from factors external to the fishery, these factors should be identified in the review and referred to any relevant managing agency for action.

A review may recommend modifications to any one of the fishery management strategies that allow harvesting of that species. This approach to the review process will avoid triggering multiple reviews for a species which is caught in multiple fisheries.

There may be circumstances where no change to the management arrangements or FMS is deemed necessary following the review. For example, a review could be triggered because the landed catch of a species declines. However, there would be little cause for concern over the performance of the FMS if the decline in landed catch of a species was clearly caused by a drop in market prices. Any price fluctuations can result in fishers adjusting their activities.

d) Contingency plans for unpredictable events

In addition to the circumstances outlined above, the Minister for Fisheries may order a review and/or make a modification to the FMS in circumstances declared by the Minister as requiring contingency action, or upon the recommendation of the Ocean Hauling MAC. In the case of the former, the Minister must consult the Ocean Hauling MAC on the proposed modification or review.

These circumstances may include (but are not limited to) food safety events, environmental events, results of research programs or unpredictable changes in fishing activity over time. Notwithstanding the above, the Minister for Fisheries may also make amendments to this FMS that the Minister considers to be minor in nature at any time.

e) Predetermined review of performance indicators and trigger points

It is likely that changes to the activities authorised under the FMS will evolve over time. It is also likely that better performance indicators will become apparent over the course of the next few years and it would then be an inefficient use of resources to continue monitoring the performance indicators that appear in this draft FMS. If new information becomes available as a result of research programs, more appropriate performance indicators and trigger points can be developed and the FMS may be amended by the Minister for Fisheries accordingly.

It is prudent to review the appropriateness of all performance indicators and trigger points not more than two and a half years from the commencement of the FMS.

f) Performance indicators and trigger points for the Ocean Hauling Fishery

Table C2. Performance indicators and trigger points for Goal 1 of the draft FMS.

GOAL 1. To manage the Ocean Hauling Fishery in a manner that promotes the conservation of biological diversity in the coastal environment		
Performance indicator	**Trigger point**	**Comments**
[Performance indicators need to be developed to monitor biodiversity impacts at the species, community and ecosystem levels]	[No trigger point set at this stage]	There are no available performance indicators to measure the impact of this fishery on biodiversity. As such, surrogate indicators will be used (below) until a suitable indicator is developed. As indicated in management response 1.3(b), the development of performance indicators will involve extensive scientific collaboration and is likely to take some time.
Area of beach totally closed to commercial fishing (through any fishing closure)	The area open to beach hauling increases after the commencement of the strategy	Significant closed areas prevent any direct impacts of the fishery on biodiversity in those areas, thus minimising the total impact on biodiversity at the regional or State-wide scale
Response of the fishery to marine pest and disease incursions	The Director, NSW Fisheries, certifies that the fishery has not responded appropriately to marine pest and disease management programs that recommend that ocean haul fishing be modified as a result of marine pest or disease incursions	The marine pest and disease management program is responsible for monitoring marine pests and diseases, and developing contingency plans in the event of new incursions

Table C3. Performance indicators and trigger points for Goal 2 of the draft FMS.

GOAL 2. To maintain fish populations harvested by the Ocean Hauling Fishery at sustainable levels		
Performance indicator	**Trigger point**	**Comments**
Total annual commercial landings of the target species	See Table C10	A further set of trigger points in addition to those in Table C10 will be developed in order to detect undesirable trends in catch data (see section 5(g) in this Chapter
Stock assessment of target species	See section 5(f)(i) of this chapter	
Total annual landings of species other than the target species	Landings are outside the range of catch for two consecutive years, with the range calculated from the period 1984/85 to 1998/99 (see comments)	A zero catch level is considered outside the range even if there have been years where no catch was recorded
Total commercial landings of each species from each gear type within each region fished	Landings in any one region changes by at least 50% between any two consecutive years	Changes in targeting or species composition may be more easily detected at a regional level
Proportion of catch comprised of target species	Catch of target species is below 95% of total landings for any method	With target species defined for each method, this provides a means of detecting shifts in targeting, should they arise
Estimates of landings of non-target species from each method, in each region	Total landings of all non-target species exceeds 5% total harvest for any method in any region per year	Non target species total to include conditional target species
Capability to limit effort through minimum shareholdings in place within two years of share management plan commencement	Minimum shareholdings not set by method and region (for hauling methods) within two years	There must be a realistic measure of fishing effort for each ocean hauling sector. Once identified, this measure is monitored for change beyond normal variation

Table C4. Performance indicators and trigger points for Goal 3 of the draft FMS.

GOAL 3. To promote and support the conservation of threatened species, populations and ecological communities associated with the operation of the Ocean Hauling Fishery		
Performance indicator	**Trigger point**	**Comments**
Number of incidental captures of listed threatened species, or from populations or ecological communities	[No trigger point set at this stage]	Data will be sourced from the scientific observer program. The design phase of the observer program will include and intitial focus on species and/or locations most likely to be at risk to aid in the design of the overall program
Response of the fishery to threatened species declarations	Threatened species recovery plan or threat abatement plan requires a modification to fishing which the Director, NSW Fisheries considers is not adequately provided for elsewhere in this draft FMS	The NSW Fisheries Office of Conservation and NSW National Parks and Wildlife Service monitor sightings of threatened species and develop threatened species recovery plans when required to do so

Table C5. Performance indicators and trigger points for Goal 4 of the draft FMS.

GOAL 4. To appropriately share the resource		
Performance indicator	**Trigger point**	**Comments**
Estimates available of non-commercial catch for target species	Estimates not available within three years from the commencement of the strategy	This relates to the need to have accurate harvest information from all sectors
Catch levels (including estimates) from the commercial, recreational and Indigenous sectors	After estimates become available, relative catch levels between sectors shifts by 25% within the first five years of the strategy	This relates primarily to the objective of monitoring and managing equitable allocations between fishing sector groups
Total annual commercial landings taken in each region	Catch levels between any two regions shifts by 25% within the first five years of the strategy	This relates to the objective of monitoring and managing equitable allocations within the fishery
Catch levels of species taken in the Ocean Hauling Fishery relative to other commercial fisheries	Relative catch levels between commercial fisheries shifts by 25% within the first five years of the strategy	This relates primarily to the objective of monitoring and managing equitable allocations between commercial fisheries

Table C6. Performance indicators and trigger points for Goal 5 of the draft FMS.

GOAL 5. To promote a viable commercial fishery (consistent with ecological sustainability)		
Performance indicator	**Trigger point**	**Comments**
Median gross return of ocean hauling fishers derived from Ocean Hauling Fishery	Median has not increased after four years of commencement of the share management fishery plan	This relates to income from the Ocean Hauling Fishery. This measure would be expected to vary much more than an industry-wide measure and would need a longer time to detect change
Average market value of ocean hauling shares	No trigger point set at this stage	It is not possible to predict how the value of shares will change during the first few years of share trading. However, once the trading period with increased minimum shareholdings has ceased, average share value may be a good indicator of economic status of the fishery
[A performance indicator will be developed to monitor economic viability at the individual fishing business level]	[No trigger set at this stage]	This will assist in the measuring of economic viability on an industry-wide basis and on the fishing business level

Table C7. Performance indicators and trigger points for Goal 6 of the draft FMS.

GOAL 6. To ensure cost-effective and efficient ocean hauling management and compliance programs		
Performance indicator	**Trigger point**	**Comments**
Overall rate of compliance by endorsed ocean hauling fishers, measured as a percentage of comply versus non-comply	Overall rate of compliance with the strategy, as estimated by the Director of NSW Fisheries, falls below 85%	The ocean hauling compliance rate during the 1999/00 financial year was 98%, and the indication is that this trend will continue through the 2000/01 period. The statewide Operational Compliance Plan will identify 'serious' offences as defined in the forfeiture offences and proposed penalty points system under section 4 of this draft FMS. Significant increases in forfeiture and penalty point system offences will trigger appropriate responses under Goal 6
Number of MAC meetings held each year	Less than two meetings held in a calender year, unless otherwise agreed by the MAC	This trigger point is currently a requirement of the Regulation
Occasions when this strategy is in direct conflict with other approved Commonwealth or State programs	Any occasion when the Director, NSW Fisheries, certifies that this strategy is inconsistent with other approved Commonwealth and State programs	This includes programs such as the aquatic biodiversity strategy, marine parks and aquatic reserves program
Performance of the NSW Fisheries meeting needs of MAC as per the Commercial Fisheries MAC Procedures Manual	NSW Fisheries fails to meet guidelines in 20% of communications with MAC	

Table C8. Performance indicators and trigger points for Goal 7 of the draft FMS.

GOAL 7. To improve public understanding of the fishery and of the resources upon which the fishery relies		
Performance indicator	**Trigger point**	**Comments**
Combine all public and fishery information and education functions into a fishery education strategy	Education strategy not developed within two years of commencement of the strategy	An education and communication strategy for the fishery will include what information is to be published and by what means
Annual publication of fishery information according to the fishery education strategy	Annual publication missed or incomplete	

Table C9. Performance indicators and trigger points for Goal 8 of the draft FMS.

GOAL 8. To improve knowledge of the Ocean Hauling Fishery and the resources upon which the fishery relies		
Performance indicator	**Trigger point**	**Comments**
Total level of funding committed to research projects that the Director, NSW Fisheries determines provide a flow of benefits to the Ocean Hauling Fishery	To be determined	Part of annual reporting on fishery status should include expenditure on research for the fishery
Number of research grant applications submitted to the NSW FRAC or external funding agencies annually relating to the Ocean Hauling Fishery	Less than two such applications submitted in a year	The outcome of such grant applications can not be guaranteed
Rate of successful external research funding applications relating to the Ocean Hauling Fishery, measured as a percentage	The percent of successful external research funding applications falls below 30% each year in two consecutive years	30% is considered to be an adequate benchmark for successful external applications. It is, for example, the approximate historical average success rate for FRDC applications
Accuracy of catch return data measured every two years	The Director, NSW Fisheries, certifies that accuracy of data has not improved (assessment of data accuracy is integral to the stock assessment program)	Accuracy will be measured by undertaking comparisons with receiver records using a sample of endorsement holders and by comparison of data from observer program

g) Monitoring performance of stock assessment

Stock assessment involves the use of various statistical and mathematical calculations to make quantitative predictions about the reactions of fish populations to alternative management choices (Hilborn and Walters, 1992). These calculations can vary from simple graphical presentations of commercial landings to sophisticated computer models that predict the biomass of the stock under various harvest regimes. The data and the scientific expertise required to apply these methods varies enormously. Stock assessment processes for the ocean hauling fishery need to be defined to suit the resources available. To achieve this outcome, short-term and long-term approaches will be applied.

The short-term approach will be to use landings of target species to monitor the performance of this fishery. Within 12 months of the commencement of the FMS a stock assessment process for target species will be proposed. The process needs to be appropriate for the data available and the value of this fishery. This will be the long-term approach that will be used to assess the target species of this fishery. Two principles will apply to the long-term proposal for stock assessments:

- assessment methods will be consistent with the data (i.e. the assessment program design will not rely on data sources that are not funded)
- assessment methods will be at least equivalent to approaches for fisheries of similar value in other Australian jurisdictions.

The exact methods that will be proposed may require the development of novel approaches. Trigger points will be an integral component of the stock assessment proposal for each species. An independent review of the assessment methods will be completed within 3 years of the proposal being developed, with the following terms of reference, to:

- report upon the technical soundness of the assessment methods proposed

- report upon the cost-effectiveness of the assessment methods proposed
- indicate if the assessment process will be likely to provide timely information for the management of the fishery
- report upon the conditions where the assessment process is likely to be unsatisfactory
- recommend revisions to the proposed approach including additional data collection strategies that should be considered.

The schedule for providing stock assessments can not and should not be the same for all target species. Priorities for each species should be determined in consultation with the assessment scientists and the appropriate MACs.

h) Setting trigger points for monitoring changes in commercial landings

A system to detect undesirable changes in landings will be used while stock assessments are being developed for target species. This primary monitoring tool is also likely to be in place for an extended period for the many species of low value (and/or catch) that do not have better estimates of stock status. As biological reference points become available from stock assessments, monitoring based solely on landings will be phased out.

Systems for monitoring based on landings only are rarely formalised, as proposed in this draft FMS, and published examples of such systems could not be found. However, the large number of species caught in most NSW fisheries means that some species must remain a relatively low priority for stock assessment. For these species, monitoring landings is the only practical choice.

A more sophisticated treatment of catch data often used in stock assessments is catch per unit effort (or CPUE) analysis. However, caution must be taken in analysing CPUE information for the reasons described in the box below.

Note on the use of catch per unit effort as an indicator of relative abundance

It is tempting to consider that there is a simple relationship between fish stock abundance and catch which has been scaled by units of fishing effort (known as catch per unit of effort or CPUE). Most stock assessment models assume that CPUE is directly proportional to stock abundance. This can only be the case if fishing effort is randomly distributed, and we know that this is seldom the case. Some fisheries target aggregations of fish, which can mean that CPUE stays high, even as total abundance drops because the remaining fish continue to aggregate.

The correct use of fishing effort data requires a good knowledge of the biology of each species that it is applied to, so that its spatial distribution can be adequately considered. Information about fishers' behaviour and gear is also important so that effort units can be standardised and changes over time can be accounted for.

An index of relative abundance based on CPUE is likely to be biased when applied to a range of species, even when caught by the same gear (Richards and Schnute, 1986). This means the application of CPUE information from commercial catch records would need to be adjusted for each species.

Finally, CPUE series need to take account of changes in reporting (see Pease and Grinberg, 1995) or other changes that may have changed catchability. The difficulties as they relate to the NSW Estuary General Fishery are discussed in Scandol and Forrest (2001). For these reasons, CPUE has not been used in the development of initial performance indicators and trigger points in this draft FMS.

The aim of trigger points based on changes in catch is to force a review of a species' circumstance when landings go beyond a reasonable expected range. Trigger points must be set at a level where they are sensitive enough to be likely to register a real problem but not so sensitive that they constantly trigger when there is no need for a review.

Trigger points will be set in a precautionary manner relative to known levels of variation in annual catch levels. That is, trigger levels will be set to be within the known range of past landings variation, leading to the expectation of "false alarms". This is desirable insurance that ensures reviews will be done when management action is needed.

There are a number of factors that must be considered when selecting a trigger level based on performance of fishery or species landings:

- level of variation in recorded historic landings
- management changes over time that may affect landings levels
- changes in the catch recording system that limit interpretation of landings data
- relevant environmental events
- changes in activities by important harvesters of that species.

All these factors have and will continue to influence how changes in catch can be interpreted.

The landings-based trigger points are designed to measure different types of changes in catch of the target species.

The first type of trigger point is designed to cause a review when landings change dramatically from one year to next – the "single year trigger". The change that triggers a review is not an unprecedented change but rather a change that was well within the normal range of variation, but expected infrequently (perhaps once every five to ten years). The single year triggers are based on the variation in year-to-year changes in the historical catch data. The trigger points are set at a level of change that occurs less than 20% of the time. In other words, changes that are at least as large as the largest 20% of historical changes will trigger a review. This level of change is chosen to ensure that there will be a review if there is a dramatic change in the circumstances of the fishery over a short period. Setting the trigger points this way means accepting the inevitable "false alarms" when the performance indicator is at the edge of its natural range. The review will determine which trigger breaches are "false alarms". The reference level for this short term trigger will be the landings level from the previous year.

The second type of trigger point is designed to detect patterns in landings that are of sufficient concern to require a review (e.g. a downward or upward trend over several years). Time series of landings for any commercial species are likely to be correlated from one year to the next (i.e. the level of landings one year is related to the level of landings in one or more previous years.) This type of data structure will complicate the analysis of trends in landings. It is not a trivial exercise to devise an objective system to force a review when catch data exhibit certain patterns. For example, downward trends in landings should cause concern but the monitoring system must consider the importance of the rate of decline and the time period over which the decline occurs. The analysis must address the likelihood of relationships between data points and any relevant biological considerations (e.g. does the species come from a group that is known to be relatively long- or short-lived?)

An objective system for defining trigger points that detect concerning trends in landings will be developed and tested during the first nine months of the FMS and applied to all target species at the first annual review. The assistance of a statistical expert will be sought to develop this system. The system may involve several different measures, including the steepness of the trend and the period over which the trend occurs.

i) How trigger points based on landings will be applied

The single year trigger is explained in the examples shown in Figure C3. These examples below explain how the single year trigger points will work with a hypothetical starting point (5 years ago), trigger levels and existing catch data.

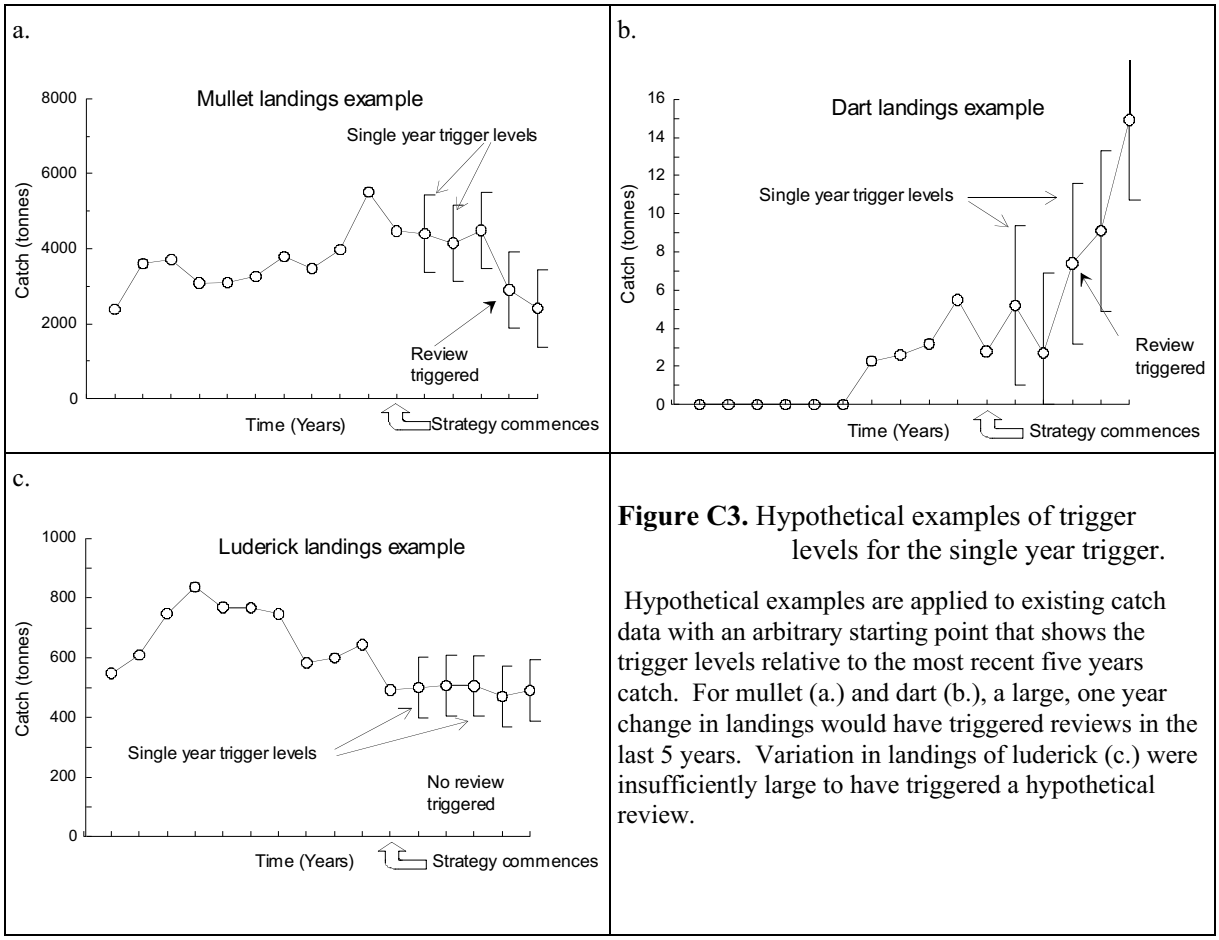


Figure C3. Hypothetical examples of trigger levels for the single year trigger.

Hypothetical examples are applied to existing catch data with an arbitrary starting point that shows the trigger levels relative to the most recent five years catch. For mullet (a.) and dart (b.), a large, one year change in landings would have triggered reviews in the last 5 years. Variation in landings of luderick (c.) were insufficiently large to have triggered a hypothetical review.

Table C10. Levels of trigger points for single year trigger.

Note: These levels will apply for the first year of the FMS only. At each annual review the trigger levels for the next year will be calculated, using the most recent year of catch data as the new reference level. The average annual change was calculated over the 16 years commencing in 1984/85 except for sweep, bonito and dart, where records commenced in 1990/91. All values in the table are in tonnes.

Target species	Reference level (99/00 catch)	Average annual change (+ 80% CI)	First year upper trigger	First year lower trigger
Sea mullet	2412.9	1022.0	3434.9	1390.9
Blue mackerel	546.3	256.4	802.6	289.9
Luderick	489.6	102.9	592.5	386.7
Yellowtail	472.9	77.8	550.6	395.1
Australian salmon	361.9	476.1	837.9	0.0
Silver trevally	300.9	275.3	576.1	25.6
Yellowfin bream	281.5	101.7	383.2	179.8
Bonito	191.5	63.9	255.4	127.6
Sand whiting	128.2	38.7	166.9	89.5
Sandy sprat (whitebait and glass fish)	76.1	40.3	116.4	35.8
Pilchards	65.2	132.8	198.0	0.0
Sweep	47.9	50.0	97.9	0.0
Anchovy	38.2	21.2	59.4	17.0
Sea garfish	37.4	91.9	129.3	0.0
Jack mackerel	19.4	337.7	357.1	0.0
Dart	14.9	4.2	19.1	10.7

j) Monitoring programs

Table C11 outlines the research or monitoring programs that are in place or planned to monitor the performance indicators. Information gathered in these monitoring programs is the basis for the monitoring the performance of the draft FMS.

Table C11. Monitoring programs in place or planned to measure the performance indicators.

Goal	Performance indicator	Monitoring program	Time frame
1	Area of beach totally closed to commercial fishing (through fishing closures, marine parks and/or aquatic reserves)	Review number and area of beaches totally closed to commercial fishing every 2 years	Begin 2002 and review every two years
1	Response of the fishery to marine pest and disease incursions	Reports will be provided to the Ocean Hauling MAC through the marine pest management program on results of monitoring marine pests and diseases	Ongoing
2	Total annual commercial landings of the target species	Annual analysis by NSW Fisheries, in consultation with the MAC, of commercial catch returns. Reports scrutinised in March/April and final report made available in June of each year	Begin 2002 and ongoing subject to annual review
2	Stock assessment of target species	Monitoring of commercial landings	Ongoing
		Estimates of non-commercial harvest	Estimates available July 2005
		Observer-based program provides estimates of size composition of landings and discards of target species. Data also assist with selectivity estimates	Begin January 2003 and ongoing subject to annual review
		Various species-specific programs	As per successful funding
2	Proportion of catch comprised of target species	Annual analysis by scientists and industry of commercial catch returns. Reports scrutinised in March/April and final report made available in June of each year	Begin 2002 and ongoing subject to annual review
2	Estimate of total quantity (annual rate) of discarded catch by method	Observer-based program that provides discard estimates of all fishing methods stratified throughout the regions	Begin January 2003 and ongoing subject to annual review
2	Ratio of discarded catch compared with total landings by method	Observer-based program that provides a predetermined cover of all fishing methods in a predetermined number of key areas stratified throughout the regions	Begin January 2003 and ongoing subject to annual review
3	Number of incidental captures of listed threatened species, population or ecological community	Observer-based program that provides estimates of capture rates for all fishing methods	Begin 2003 and ongoing subject to bi-annual review
4	Estimates available of non-commercial catch for target species	Recreational creel surveys and compliance reports	Complaince reports are ongoing, July 2005
4	Catch levels (incl. estimates) from the commercial, recreational and Indigenous sectors	Annual analysis by scientists and industry of commercial catch returns. Reports scrutinised in March/April and final report made available in June of each year	Begin 2002 and ongoing subject to annual review

Table C11. (cont.)

Goal	Performance indicator	Monitoring program	Time frame
4	Catch levels of species taken in the Ocean Hauling Fishery, relative to other commercial fisheries and among regions within the fishery	Annual analysis by scientists and industry of commercial catch returns. Reports scrutinised in March/April and final report made available in June of each year	Begin 2002 and ongoing subject to annual review
5	Median gross return of ocean hauling fishers derived from commercial fishing in NSW	Part of the annual review will involve calculating the median gross return of fishers endorsed in the ocean hauling fishery, by multiplying their monthly catches with the respective average Sydney Fish Market price (or other agreed price information).	Ongoing
5	Average market value of ocean hauling shares	The market value of shares will be collected and recorded by the Share Registrar upon each share transfer. The average market value will be calculated each year as part of the annual review	Ongoing
5	Viability of Ocean Hauling Fishery and businesses therein	Performance indicator and associated monitoring to be developed	From July 2005
6	Overall rate of compliance with by endorsed ocean hauling fishers, measured as a percentage of comply versus non-comply	The compliance rate will be calculated as part of the annual review using the Project Activities Summary Reports (PARS) that are completed by the Field Services Branch	Ongoing
6	Number of MAC meetings held each year	The number of ocean hauling MAC meetings held will be determined as part of the annual review based on the records held by NSW Fisheries	Ongoing
6	Occasions when this strategy is in direct conflict with other approved Commonwealth or State programs	The major parallel programs will be reviewed as part of the annual review, but others may be reported to NSW Fisheries and the Ocean Hauling MAC on a case by case basis	Ongoing
6	Performance of NSW Fisheries meeting needs of MAC as per the Commercial Fisheries MAC Procedures Manual	NSW Fisheries service agreement	Ongoing
7	Annual publication of fishery information according to fishery education strategy	Strategy determines means and frequency of information dissemination	Ongoing
8	Total commercial landings of all species from each net within each region fished	Annual analysis by scientists and industry of commercial catch returns. Reports scrutinised in March/April and final report made available in June of each year	Begin 2002 and ongoing subject to annual review
8	Total level of funding committed to research projects that provide a flow of benefits to the Ocean Hauling Fishery	Annual review of total research funding from consolidated and external funds that are being spent on Ocean Hauling Fishery	Begin 2002
8	Number of research grant applications submitted to external funding agencies annually relating to the Ocean Hauling Fishery	via the Ocean Hauling MAC submit at least one grant application, that relates to the fishery, to external funding agencies annually	Begin 2002
8	Accuracy of catch return data measured every two years	Analysis of comparisons of catch return records with Fish Receiver data and compliance data, and observer-based surveys every two years	Begin by July 2002 and review every two years

6. Proposed Harvesting Strategy

a) Fishery status

i) Number of fishers

In May 2001, NSW Fisheries licensing database showed 404 fishers were endorsed to operate in the Ocean Hauling Fishery. This number however, constantly varies due to a number of factors including the transfer and amalgamation of fishing businesses and late payments on renewal of fishing licences.

ii) Implementation of share management

The Ocean Hauling Fishery is in the process of moving from being a restricted fishery (under section 111 of the FM Act) to a category 2 share management fishery following changes to the FM Act in December 2000. The progression to a share management regime involves a staged implementation.

The fishery is first identified as a share management fishery by being included in Schedule 1 of the FM Act. Criteria for the allocation of shares are then determined and when the allocation formula has been decided, a public notice is published inviting applications for shares. Based on the criteria and applications received, provisional shares are issued.

After provisional shares are issued, a legal order is placed in the NSW Government Gazette commencing the "limited access stage" of share management. Once the limited access stage commences a person must hold at least one provisional share in the fishery to be eligible to hold an endorsement. Throughout this stage, the fishery continues to operate under the Regulation.

Applications for appeals against the allocation of shares are lodged before the fishery is formally commenced. The management plan for the fishery is prepared and put into regulation, final shares are issued and the fishery then commences as a full share management fishery.

At present the Ocean Hauling Fishery is at the stage of consulting over the criteria for the allocation of shares. A share management plan for the fishery will be prepared in accordance with the agreed goals, objectives and management responses outlined in the final FMS.

It is possible that, in the future, the fishery may become a category 1 share management fishery. It is intended that this FMS will apply to the fishery whether it has category 1 or category 2 share management status.

b) Fishery description

As discussed in Chapter B and the introduction to this chapter, the Ocean Hauling Fishery is one of nine major commercial fisheries in NSW. It is a fishery that uses purse seine nets and a variety of hauling net types to harvest fish (except lobster and abalone) targeting a relatively small number of species such as sea mullet, luderick, yellowtail, blue mackerel, sea garfish and pilchards.

The fishery is categorised into a number of endorsement types that determine the types of fishing gear each fisher is allowed to use. Table B6 in Chapter B shows the endorsement types available in the fishery and details the activity that is authorised by each endorsement. For example, only fishers with an ocean hauling class C (purse seine) endorsement may take fish for sale using

purse nets in ocean waters. More detailed discussion of fishing licences and endorsements for the fishery appears in section 5(b)(i-iii) in Chapter B and section 6(i)(i-iii) of this draft FMS.

c) Area

The waters in which ocean hauling may be undertaken include the following:

(a) ocean waters within three nautical miles of the natural coastline (as defined in Schedule 1 of the *Fisheries Management (General) Regulation 1995*)

(b) the waters of Jervis Bay

(c) the waters of Botany Bay east of a line drawn from Bare Island generally southeast to the northernmost extremity of Sutherland Point (This inclusion of part of Botany Bay in the Ocean Hauling Fishery will cease from May 2002)

(d) the waters of Coffs Harbour.

Ocean waters are defined under Schedule 1 of the Regulation as waters east of the natural coastline of NSW, which is defined by a line drawn along the high water mark of the sea. In general, where an estuary meets the coast, the natural coastline is defined as follows:

(a) a line drawn across the eastern most extremity of two breakwalls

(b) a line drawn from the eastern most extremity of the one breakwall to the northern or southern extremity of the high water mark on the opposite bank

(c) a line drawn across the entrance between the eastern most high water mark of the two banks.

Not all NSW ocean beaches and ocean waters are open to the Ocean Hauling Fishery. Appendix B2 contains those closures authorised under section 8 of the FM Act that specifically restrict the area of ocean beaches (and/or ocean waters) where the fishery may operate (see section 6(i))(x) of this chapter for further information on closures). Details of fishing closures in NSW can be found on the NSW Fisheries website at www.fisheries.nsw.gov.au. The draft FMS proposes to continue the use of time and area closures to restrict the access of commercial fishers when and where necessary (refer to management response 4.5(a)) Additional areas of ocean waters and sea beaches may be closed to ocean hauling operations through the declaration of marine protected areas, such as marine parks, aquatic reserves, intertidal protected areas and national park or reserve extension areas. Further information relating to marine protected areas is provided in section 6(d) in Chapter B.

It is important to note that most class A (skipper) endorsement holders and all class B (crew) endorsement holders, particularly the beach-based haulers, are also restricted to operating within one of seven regions along the NSW coast. The Ocean Hauling MAC has recommended that all remaining class A endorsement holders (i.e. those boat-based haulers with multi-region access, be restricted to a single region - see management response 2.5(f) in section 4 of this draft FMS). The class C (purse seine) endorsement holders are not restricted to purse seining in any one region. Class D (purse seine north) endorsement holders are restricted only to ocean waters north of Latitude 32° South.

d) Methods

Fishing gear used in the fishery consists of a range of hauling nets and purse seine nets used to target finfish. Although not a prescribed method of the fishery, the use of a lift net by licensed

commercial fishers to take bait for tuna operations is also proposed to be managed by the Ocean Hauling Fishery.

The following sections describe the fishing gear prescribed for use in the fishery and give details relating to the standard dimensions of that gear. Further detailed information on the method of use of these nets can be found in section 3 of Chapter B. Appendix C1 identifies more specific gear dimensions proposed by the draft FMS and any variations due to area. The dimensions that apply to some of the gear types differ between ocean waters and Jervis Bay. For example, the general purpose hauling nets able to be used in ocean waters have a longer overall length of net and different mesh size (outside of the travelling season) to the general purpose hauling nets able to be used Jervis Bay. Management response 2.1(c) proposes to restrict the gear dimensions of nets used in the fishery to those defined in Appendix C1.

The FMS proposes to restrict the species taken by each prescribed gear type to identified target species, conditional target species, and allows for byproduct (subject to conditions) (see management response 1.3(a)). Section 6(e) provides further details on the definition of target, conditional target and the byproduct rule. Under the proposed FMS, a 'priority of shot' rule will apply to teams hauling to and from sea beaches (see section 3(c) of Chapter B for further information).

i) General purpose hauling net

These hauling nets are made from netting material varying in mesh size, with a minimum mesh of 50 mm in the bunt and a minimum mesh of 80 mm in the wings of the net for most of the year. The length of each hauling line attached to the net does not exceed the total length of the net to which it is attached. The measurements of the net in the travelling season (1 March to 31 July each year) are 50 - 65 mm in the bunt, 65 - 86 mm in the wings, with the maximum length of the net not to exceed 400 metres. In ocean waters and on sea beaches the bunt of the net must not exceed 1/3 of the total length of the net excluding hauling lines.

This net type is predominantly used to catch sea mullet, however, it is lawful to retain a broad range of species, including bream and luderick, caught in this net whilst it is being used in ocean waters. Although minimum mesh sizes apply to general purpose hauling nets, the impact of hauling on bycatch species or organisms not retained by the net are generally unknown. Details of the proposed target species, conditional target species and byproduct rule for the general purpose net are contained in Appendix C1.

The draft FMS proposes to amend the definition of the general purpose hauling nets, by excluding the use of rings on the net and requiring that the net must be used to and from the beach. Amendments to the definition of general purpose hauling nets used in Jervis Bay are also proposed within Appendix C1.

ii) Pilchard anchovy and bait net

The draft FMS proposes that it be lawful to use this hauling net provided that the total length of the net does not exceed 300 m with hauling lines of no more than 500 m each and the mesh size throughout is not less than 13 mm. All additional proposed amendments to the definition and use of the pilchard, anchovy and bait net are contained within Appendix C1.

This net type is predominantly used to catch pilchards, yellowtail, blue mackerel and whitebait. Details of the proposed target species, conditional target species and byproduct rule are contained in Appendix C1.

iii) Garfish hauling net

A garfish hauling net is a net specifically designed to catch garfish. This draft FMS proposes to drop the concession to use garfish hauling nets as small as 25 mm mesh dimension. The permissible mesh size dimensions of a garfish hauling net will be strictly limited to 28 mm or more. Mesh size restrictions are used to prevent the capture of small fish or non-target species. The proposed total length of a garfish net (previously unspecified) is to be no more than 300 m with rope not exceeding 300 m.

Sea garfish constitute the majority of the catch taken by these nets and they are proposed to be the single target species for this method. Details of the proposed byproduct rule and all additional proposed amendments to the definition and use of the garfish hauling net are contained within Appendix C1.

iv) Garfish bullringing net

The garfish bullringing net is historically a method used in estuary waters to target garfish, and this is proposed to be removed from use in ocean waters (see management response 2.5(e) in section 4 of this draft FMS).

v) Purse seine net

In Twofold Bay and Jervis Bay, there are no mesh size restrictions, however, the total length of a purse seine net must not exceed 275 m. In all other ocean waters the mesh size throughout the net must not exceed 150 mm. The draft FMS proposes to apply the 150 mm mesh restriction to those nets used in Jervis Bay and Twofold Bay. The net length must not exceed the length on the net registration, however, the maximum length proposed for a purse seine net used in ocean waters (with the exception of Twofold Bay) is 1000 m. It is proposed that all purse seine nets must be shot from a boat and retrieved to a boat.

Purse seine nets predominantly target species such as pilchards, yellowtail and blue mackerel. Details of the proposed target species, byproduct rule and all additional proposed amendments to the definition and use of the purse seine net are contained within Appendix C1.

vi) Lift net

A lift net is used only for collection of pilchards, blue mackerel and yellowtail as bait for taking tuna. It consists of netting which can be suspended from a rigid frame and is submerged below the vessel operating the net.

Only commercially licensed fishers in NSW targeting tuna may operate a lift net to take bait for the tuna operation. A number of Commonwealth fishers, with either tuna longlining, poling or tuna purse seining Commonwealth permits, have been issued NSW commercial licences and restricted to a licence condition that only permits their use of a lift net to take bait for their Commonwealth tuna operations. Details of the design and use of this net can be found in Appendix C1. The proposed management of the harvest of bait using this method is described in management responses 2.1 (e and f) in section 4 of this draft FMS.

e) Species

The Ocean Hauling Fishery is considered to be a very target specific fishery. As discussed in the previous section, for each net prescribed by the fishery, Appendix C1 identifies the target species that may be taken and provides a rule for taking byproduct species. Any additional conditions excluding the taking of certain species by individual methods, such as a prohibited size class of fish by a purse seine net, have been included in Appendix C1.

Although a relatively short list of target species have been identified for each net, the general purpose hauling net has traditionally taken a much broader range of species than other nets in the fishery. Some species, while not generally targeted all year, may be targeted by fishers on rare occasions with a general purpose hauling net. A list of conditional target species has been identified in Appendix C1 for the general purpose net only, to provide for such occasions. Where the opportunity arises, a shot may be taken comprising mostly of conditional target species. However, these species cannot be continually targeted throughout the year.

By-product allowed in each net type is dealt with in two ways:

(1) provision of a compliance rule to prevent targeting of current non-target species, at least 80% by weight of any shot must comprise target or conditional target species

(2) regionally, and fishery wide, target species for each method must be more than 95% of annual landings.

Table C13 includes the determination of whether a species is a target species, conditional target species, or species not permitted to be taken for each net authority in the fishery. As conditional target species are not to be continually targeted throughout the year, the total annual catch of such species must still fall within the 5% byproduct rule for the total catch taken by a general purpose hauling net annually in each region.

Conditional targets species may be taken in combination with all other byproduct species up to 5% of the total catch. The conditional target species listed in Table C13 fall into three categories in terms of their management and the responsibility for their assessment. Three tuna species (not including mackerel tuna) are all managed by the Commonwealth and their harvest in the Ocean Hauling Fishery is by agreement under the offshore Constitutional Settlement. The catch of these species is insignificant in the Ocean Hauling fishery compared to other fisheries. Spanish mackerel, mackerel tuna, mulloway and tarwhine are all managed by NSW and taken largely (>95%) in other fisheries such as the Ocean Trap and Line Fishery. The third group of conditional target species contains leadenall (frigate mackerel) and diamond fish. The Ocean Hauling Fishery is the primary harvester of these species in NSW waters with landings (averaged annually from July 1997 to June 2000) of 5.2 and 1.5 tonnes per year respectively. These later species, along with many of the other byproduct species are managed by the total byproduct limit with careful monitoring to prevent targeting but are unlikely to be the subject of formal assessment in the near future.

i) Species taken in the fishery

Section 1(b) of Chapter B outlines the list of species recorded as landed catch by the method of ocean hauling during 1998/99.

ii) Bycatch species

No estimates of bycatch for any method in the Ocean Hauling Fishery are available. Anecdotal evidence and recorded landings suggest that catches within the fishery tend to be targeted at a single species and with little bycatch. Fishers observe schools prior to deploying nets and are thought to be able to determine catch composition with reasonable accuracy. Catches taken by beach haul nets generally consist of mature adults. Various species of sharks and rays are occasionally taken in small quantities. Studies identifying actual bycatch species in the fishery and investigating the best-practice techniques to minimise any bycatch are proposed in management responses 1.1a-c in section 4 of this draft FMS.

iii) Status of species within the fishery

NSW Fisheries uses a standardised method of reporting for the exploitation status of fish stocks across all commercial fisheries. Where there are data, the impact of the recreational harvest is also taken into consideration in determining the status. This reporting method uses the terms defined in Table C12 to describe the stock status:

Table C12. Definitions of exploitation status of fish stocks.

Exploitation status	Definition
Under fished	The appraisal of a fish stock that suggests that the stock has the potential to sustain catches significantly higher than those currently being taken
Moderately fished (sustainable)	The stock is assessed to be fished at levels which would probably allow only limited increases in catches
Fully fished (sustainable)	The appraisal of a stock which suggests that current catches are sustainable and close to optimum levels (the definition of which may vary between fisheries; e.g. catches are close to maximum sustainable yield, or fishing effort is close to a biological reference point). In a fully fished fishery, significant increases in fishing effort above current levels may lead to overfishing
Overfished / Depleted	The appraisal suggests that current fishing levels may not be sustainable, and/or yields may be higher in the long term if the fishing level is reduced in the short term. This may be due to recruitment overfishing, growth overfishing and/or as a result of habitat degradation
Uncertain	There is little or no information about the status of this stock (e.g. no catch data or only very recent catch data)
Unknown	The only information about the status of this stock is long term fishery dependent catch data

iv) Overfished species

When a species taken in this fishery is determined as 'overfished', this draft FMS requires the implementation of, or assistance in developing, a recovery program for that species (see objective 2.5 and related management responses in section 4 of this draft FMS). A recovery program must include a description of the actions proposed to return to acceptable levels those parameters which have led to the determination of being 'overfished'. The recovery program will also set out a timeframe for that process and may specify further appropriate action should recovery targets not be met.

Definitions of overfished status

There are two types of overfishing, both of which, when detected, require management action. It is important to note that the two are not mutually exclusive. "Growth overfishing" occurs when individual fish are typically harvested before the size that takes best advantage of the species growth in relation to expected natural mortality. "Recruitment overfishing" can be far more serious and occurs when fishing pressure has reduced the ability of a stock to replenish itself.

Designation of a species as overfished

The information needed to clearly determine that a species has been growth overfished is more likely to be available than the information needed to detect recruitment overfishing. Most formal definitions of recruitment overfishing are determined on the basis of an understanding of relative rates of fishing mortality, population growth and population biomass as well as the relationship between spawners and recruitment (e.g. Hilborn and Walters, 1992). Even the most thoroughly studied species in NSW may not have relevant information on all those topics.

NSW Fisheries will consider advice from fisheries scientists as part of the annual assessment of the status of fish stocks in NSW, or as a result of a review arising from a trigger point breach (see section 5 of this draft FMS). That advice could come as results of internal research become available, or from other agencies doing research relevant to assessment of species harvested in NSW. If the species is the subject of a formal stock assessment process, the indication of overfishing is likely to come from having a performance indicator outside acceptable parameters. Other species' status will be reviewed on the basis of the best available biological and catch information. Table C13 shows the target and conditional target species of the fishery, and provides information (where data is available) on the exploitation status of the species.

A stock that has had sufficient fishing mortality to cause a reduction in recruitment requires effective remediation. However, information that clearly demonstrates that a species recruitment has been impacted by fishing is difficult and expensive to collect and likely to be rare. Management responses will need to be precautionary and are likely to draw inference from catch and catch composition, rather than from direct measurements of recruitment. For example, rapid declines in catch (especially when the species is targeted in a spawning aggregation), increases in average size or missing years in age compositions are all indicative of potential problems with recruitment.

When new information that is likely to change the present status of a fish species is received by NSW Fisheries, NSW Fisheries scientists will review the status determination for that species against the criteria specified in Table C12 and report on the updated status in the annual report "Status of Fisheries Resources". If a species is designated as overfished, a recovery program involving all harvest sectors will be developed.

Table C13. Relationship among methods of target and conditional target species for all ocean hauling methods.

No take means the species may not be landed from that method.

Species	Exploitation status	Net Authorities			
		GP hauling net	Garfish net	PAB net	Purse seine net
Sea mullet	Fully Fished	Target	No take	Not take	No take
Blue mackerel	Moderately to Fully Fished	Target		Target	Target
Yellowtail	Fully Fished			Target	Target
Yellowfin bream	Fully Fished	Target	No take	No take	No take
Sea garfish	Overfished		Target	No take	No take
Sand whiting	Moderately Fished	Target	No take	No take	No take
Pilchards	Unknown			Target	Target
Australian salmon	Unknown	Target			Target
Luderick	Moderately Fished	Target	No take	No take	No take
Dart	Unknown	Target			
Sandy sprat (whitebait and glass fish)	Unknown			Target	Target
Jack mackerel	Unknown				Target
Anchovy	Unknown			Target	Target
Bonito	Unknown	Conditional Target			Target
Silver trevally	Fully to Overfished	Conditional Target			Target
Sweep	Unknown	Conditional Target			Target
Leadenall (Frigate	Unknown	Conditional Target			
Mackerel tuna	Unknown	Conditional Target			No take
Northern bluefin tuna	Unknown	Conditional Target			No take
Tarwhine	Unknown	Conditional Target	No take	No take	No take
Diamond fish	Unknown	Conditional Target			
Yellowfin tuna	Unknown	Conditional Target			No take
Mulloway	Unknown	Conditional Target	No take	No take	No take
Spanish mackerel	Unknown	Conditional Target			
Big eye tuna	Unknown	Conditional Target			No take

Appropriate management responses for different types of overfishing

Growth overfishing generally implies the productivity of a stock is being mismanaged by harvesting animals at too young an age. Fish stocks that are growth overfished are not necessarily in danger of imminent collapse and populations can be growth overfished and still be stable. However, growth overfishing may increase the risk to the population of subsequent recruitment failure arising from fishing pressure or external factors. The typical and most appropriate response to growth overfishing is to increase the average size at first harvest. This is commonly done by imposing a minimum size limit or increasing an existing one. The efficacy of such a response depends largely on the methods of capture and whether the selectivity of those methods can be appropriately altered to match the new size limit, as otherwise wasteful discarding can occur. Careful thought must be given to changing size limits where there are problems in adjusting the selectivity of the primary fishing methods for that species.

Recovery programs for species suspected of having depressed recruitment due to overfishing must include strong precautionary action. Actions could include (but may not be limited to)

temporary fishery closures or caps on either catch or fishing effort. Recovery programs for recruitment overfished species may also include changes to the monitoring program for that species and/or require targeted research to improve the assessment of risk to the species in critical areas.

Species in the fishery determined as being overfished

Sea garfish (*Hyporhamphus australis*)

A dramatic decline in the landings of sea garfish through the 1990s has prompted concern over the status of the stock. The concern is heightened by the lack of knowledge of the biology of the species. Catch levels are as low as 10% of the values from the early 1990s and the high value of the species makes it more likely that the decline in catch reflects a decline in abundance of the species.

The Ocean Hauling Fishery is the primary harvester of sea garfish and this draft FMS will be the source of the recovery program for that species (see objective 2.5.1 and associated management response). The Estuary General Fishery is the only other significant harvester of sea garfish. Significant aspects of the recovery program are to be negotiated between the Estuary General MAC and the Ocean Hauling MAC (refer to management response 2.5(e)).

Appendix B1 includes a summary of sea garfish, including general information on the biology of the species, habitats, catch and market information.

Silver trevally (*Pseudocaranx dentex*)

Rowling and Raines (2000) determined silver trevally as being growth overfished. There has been a significant decline in commercial landings of silver trevally since the mid 1980s, from about 1000 tonnes per annum to around 300 tonnes per annum. The Ocean Hauling Fishery catches approximately 1% of the total NSW commercial catch of silver trevally (based on average landings 1997/98 and 1998/99). Significant catches of silver trevally are taken in the ocean fish trawl (55%), ocean trap and line (28%) and estuary general fisheries (16%) in NSW and the south east trawl fishery managed by the Commonwealth. There is also a significant recreational catch of the species.

As the Ocean Fish Trawl Fishery is the primary fishery in NSW in which silver trevally are taken, a recovery program for the species will be developed for the species under the Ocean Fish Trawl FMS. The Ocean Hauling Fishery will contribute to the development of the recovery program, and will implement actions as needed under that program.

Appendix B1 includes a summary of silver trevally, including general information on the biology of the species, habitats, catch and market information.

Specific actions in the FMS to address overfishing

Objective 2.5 in section 4 of this draft FMS provides a mechanism for the fishery to participate in the recovery of overfished species. The objective has three major management responses as set out below and the most appropriate management response for the fishery to adopt will be dependent upon the catch levels relative to other fisheries. The three management responses for objective 2.5 are listed below:

(*a) for species where the fishery is a major harvester, develop and implement a recovery program for the species within a specified timeframe*

(b) or species where the fishery is a minor harvester, contribute to the development of and/or participate in the implementation of a recovery program for the species and adopt any measures required by that plan

(c) during the period of development of the recovery program for a species that has been determined as being recruitment overfished, implement precautionary actions including but not limited to:

-total harvest controls

-reductions in effort associated with the harvest of the species

-the implementation of fishing closures

-bycatch management provisions

-mandatory gear changes.

v) Size limits

Size limits apply to a number of key species taken in the Ocean Hauling Fishery. Table C14 lists the minimum legal lengths that apply to species permitted to be taken in the fishery.

Table C14. Minimum legal sizes species that may be taken in the Ocean Hauling Fishery.

Species	Size limit - Total length (cm)
Sea mullet	30
Luderick	25
Bream (yellowfin or black)	25
Tailor*	30
Mulloway	45
Tarwhine	20
Sand whiting	27
Dusky flathead	36**
Sand flathead	33
Snapper	30***
Teraglin	38
School shark	91

*increased from 33 cm on 1 July 2001

** increased from 28 cm on 1 July 2001

vi) Protected fish

The *Fisheries Management (General) Regulation 1995* identifies a number of species that are protected, either from commercial fishing or fishing by all sectors.

Fish protected from commercial fishing include:

Black, blue and striped marlin	Blue groper
Atlantic salmon	Silver perch
Australian bass	Brook, brown and rainbow trout
Eel-tailed catfish	Freshwater crayfish
Estuary perch	

Protected fish from all sectors include:

Ballina angelfish	Herbsts nurse shark
Eastern blue devil fish	Black rock cod
Elegant wrasse	Weedy sea dragon
Estuary cod	Australian grayling
Giant Queensland groper	Eastern freshwater cod
Great white shark	Trout cod
Grey nurse shark	Macquarie perch

Commercial fishers are not permitted to take either protected fish or fish protected from commercial fishing.

Of the species that appear in the lists above, fishers in the Ocean Hauling Fishery are not likely to have any direct or indirect interaction with the majority of the species. The only interactions between the fishery and protected fish are most likely to involve the incidental capture of blue groper, the composition for resources with predators such as sharks and cods.

vii) Interactions with threatened species and species of public concern

Although interactions with threatened species have not been recorded in this fishery and are thought to be minimal, this draft FMS proposes two direct measures to obtain data on any such interactions. The first of these measures is the implementation of a scientific observer program which will collect data on interactions (see management response 1.1(a)). Secondly, a modification to the monthly mandatory catch return forms will incorporate reporting fishers' interactions with threatened species (see management response 3.1(a)).

A number of management responses also appear in section 4 of this draft FMS, which are aimed at minimising impacts on threatened species. These measures include using fishing closures (management response 4.5(a)), modifying gear use (management response 1.1(b)) and implementing the provisions of any threatened species recovery plans or threat abatement plans (management response(3.1(b)).

f) Catch and landings

i) Catch levels and value

For a discussion of the total catch levels and values in recent years, please refer to section 4(b) in Chapter B.

ii) Catch and landings of the prominent species in the fishery

Appendix B1 provides a number of graphs for some of the target species in the fishery which show:

- the total catch for each of these species for the period 1984/85 to 1999/00
- the average catch by month for the period 1997/98
- the distribution of the commercial catch between the commercial fisheries in NSW for the period 1997/98

- the gear types used to take each of the prominent species in the Ocean Hauling Fishery for the period 1997/98.

iii) Catch monitoring

The information collected on commercial landings assists in the ongoing monitoring and assessment of the status of fish stocks. The catch and effort information collected from commercial fishers has other critical roles in fisheries management including helping understand patterns of fishing activities and the mix of species from targeted and general fishing operations.

Under the draft FMS, fishers in the Ocean Hauling Fishery will continue to be required to submit records on a monthly basis detailing their catch and fishing effort (see management response 8.2(a)). The information includes total landed catch for each species, the effort expended (for each method) to take the catch (i.e. days fished), and the area/s fished. This information is entered onto a database by NSW Fisheries and will allow for analysis of fishing activity, catch levels and effort levels.

The accuracy of the data provided on catch returns, particularly with respect to fishing effort data, is often poor. There are a number of management responses proposed in section 4 of this draft FMS to improve the quality and reliability of the information provided on the returns, including a review of the current catch return reports and validation of catch and effort data under the proposed scientific monitoring program.

To maximise the accuracy of the data collected on monthly catch returns a range of quality-control procedures are currently in place or scheduled for implementation in the near future. A brief synopsis of these quality control procedures is provided here:

(i) Every return is scanned for errors when received by the "Commercial Catch Records" section and omissions and errors are queried with fishers (by phone and/or written correspondence) and corrected.

(ii) Logical checks of data accuracy (range, consistency and validity checks) are performed automatically by computer during data-entry. Likely errors are queried with fishers (by phone and/or written correspondence) and corrected if necessary.

(iii) Following a recent review (May 2001), fishers who have not submitted catch returns during the period July 1997 – Dec 2000 are being notified and asked to submit missing returns. This process is currently being completed for several fisheries and is scheduled to be done for the Ocean Hauling Fishery in early 2001-02. Following completion of this process and update of the database, a regular process whereby missing returns are identified and chased-up (every few months) will be implemented (in early 2001-02).

(iv) Data from the commercial catch statistics database "FINS" is regularly downloaded to a database "COMCATCH" which can be accessed/queried by biologists and managers responsible for individual fisheries. Subsequently, any problems with data identified by the responsible biologists/managers are queried/corrected by the commercial catch records section (consulting fishers if necessary).

(v) A recent pilot survey was done to assess the accuracy of data entry. The results showed that data-entry errors by staff were of minimal significance. Errors were rare and generally

concerned minor species. It is planned to repeat this survey annually to provide ongoing monitoring of the quality and accuracy of data entry.

(vi) Following implementation of routine reporting of the quantities of fish handled by registered fish receivers in NSW (to commence during 2001-02), it will be possible to compare the quantity of catch (by species) reported by fishers on catch returns with the quantity handled by fish receivers in NSW. This will provide a cross-validation of weights of individual species caught and handled in NSW.

(vii) The information collected on catch returns and options for improving the catch return forms (and increasing the reliability of data) is reviewed periodically by the management advisory committees and annually by the "Catch and Effort Working Group" which comprises industry representatives from each fishery. This working group was convened for the first time in April 2001.

g) Research

i) Stock assessment

The monitoring of commercial catches forms the full or partial basis for stock assessment of all species targeted by the Ocean Hauling Fishery. Generally, catch is not an ideal index of stock abundance because it can be influenced by factors unrelated to fish availability. To generate a more reliable index of abundance, catch can be standardised by fishing effort and reported as catch per unit effort (CPUE), however, fishing effort within the Ocean Hauling Fishery is difficult to quantify and has been reported ambiguously in the past. As a consequence, CPUE cannot currently be determined with confidence for most target species within the fishery. Changes in the methods of reporting of catch and effort by ocean hauling fishers, however, will improve the quality of this data, and may provide an index of stock abundance in the future (refer to objective 8.2 and associated management responses).

It is proposed that the quality of catch and effort data from the Ocean Hauling Fishery be improved via the use of daily logbooks. Logbooks will be designed in consultation with industry and will allow fishers to report daily catch and effort, including number of shots completed and hours of search time per day (see management response 8.2(d)). It is intended that the performance of logbooks will be tested in a pilot study in 2002 and, if appropriate, be fully implemented across the fishery in 2003. In conjunction with the logbook, a daily 'spotting' diary is also proposed (see management response 8.2(e)). This would allow fishers to record all fish observed, including fish not captured. Beach hauling fishers are uniquely positioned to provide detailed information about the abundance of fish in coastal waters. Fishers are highly skilled at estimating the composition and size of schools, and spend many hours observing the movement of fish along the coast. Since the fishery operates along the length of the NSW coastline, ocean hauling fishers can potentially function as a network of observers, providing details of coastal fish movement and abundance that are comprehensive in time and space. Such observations could provide estimates of abundance for many target species, including a spawning stock abundance estimate for sea mullet. This information could be obtained at a fraction of the cost of fishery-independent surveys of the same fish stocks, but is dependent on the accurate and honest reporting by commercial fishers.

Age-based assessments are a significant improvement on assessments that are based on the monitoring of catch and effort alone. When used in conjunction with an appropriate measure of

CPUE, the age composition of landings provides a strong basis for stock assessment. Sufficient funding is currently available to NSW Fisheries researchers to conduct age-based assessments for sea mullet and bream only. Methods for these assessments were established with external funding assistance (Virgona *et al.,* 1998; Gray *et al.,* 2000). A three year Fisheries Research and Development Corporation (FRDC) funded project to investigate the biology and fishery of eastern sea garfish, including the development of ageing techniques, commenced in late 2001. In the future, age-based assessment should be introduced for other target species in the fishery, especially relatively long-lived species such as yellowtail scad and silver sweep. Estimates of the age composition of yellowtail scad and blue mackerel were made in 1996-1997 (Stewart *et al.,* 1998).

It should be acknowledged that fishery-dependent information about stock structure will frequently be limited because of the selectivity of fishing gear. Ideally, assessment should include fishery-independent monitoring of stock abundance and structure. There is potential to independently monitor the abundance of some target species within the fishery. For example, aerial surveys of migrating sea mullet, or acoustic surveys of baitfish, may be possible, however, independent monitoring of many species may prove to be prohibitively expensive.

Relative abundance indices for many important species in the Ocean Hauling Fishery will become available as part of the fishery independent survey proposed in the Estuary General FMS. The stock assessment process for these species will greatly benefit from that survey and the flow of benefits will accrue to all sectors harvesting these species.

Two significant issues affecting stock assessment of species targeted by the Ocean Hauling Fishery are as follows :

(i) Stock assessment of sea mullet is rudimentary because of the lack of a reliable abundance index. This is despite sea mullet landings being the highest in quantity and value of all finfish species caught and managed in NSW. If spawner abundance can be determined from data provided by new logbooks, total stock abundance could then be estimated if the proportion of spawners in the population was known. Analysis of microchemical 'migration markers' in otoliths could potentially reveal the proportion of spawners in a given year.

(ii) Landings of yellowtail scad reported by ocean hauling fishers (mainly purse seine) have increased considerably over the last decade and are currently approximately 500 tonnes annually. The other key baitfish species, blue mackerel, is caught in similar quantities. Significant under-reporting of baitfish landings by fishing sectors outside the Ocean Hauling Fishery, including recreational fishers and Commonwealth fishers, currently hinders assessment of these species. Catch composition of all sectors, including the Ocean Hauling Fishery, is poorly documented. Evidence from New Zealand, and limited evidence from eastern Australia, suggests that both species may live for 20-30 years off NSW (Stewart *et al*., 1998). A FRDC pre-proposal was submitted in 2001 to quantify catch, document catch composition and examine reproductive biology of yellowtail scad, blue mackerel and jack mackerel. A collaborative study between NSW, WA, SA, Tas. and Commonwealth fisheries agencies was proposed. This study will commence in mid 2002 if funding is approved.

Priority ranking for assessment of target species in Ocean Hauling Fishery

Below are the target species for the Ocean Hauling Fishery listed in order of priority for stock assessment. The Ocean Hauling Fishery team has assigned priority according to:

i) size of catch level and value within the fishery

ii) trends in total and fishery catch

iii) biological knowledge

iv) the extent to which it is targeted by other fisheries.

For example, by these criteria, silver trevally is given a medium priority, despite serious stock concerns, because it is mainly targeted by the Ocean Fish Trawl and Ocean Trap and Line Fisheries.

As another example, Australian salmon is given a medium priority, despite lack of concern about the stock, because the Ocean Hauling Fishery is the main fishery to target this species. In other words, assessment of this species is reliant on the priority given to it by the Ocean Hauling Fishery. In prioritising this species, we also considered some management factors.

1. **Sea mullet.** Very high catch level and value in the Ocean Hauling Fishery. Recent decline in catch.

2. **Sea garfish.** Very serious catch decline in NSW. High value in the Ocean Hauling Fishery prior to decline. Not significantly targeted by other fisheries. Limited knowledge of biology.

3. **Yellowtail.** High value and catch in the Ocean Hauling Fishery. Stable recent catch level. Potentially significant quantities taken by other fisheries resulting in uncertainty about total catch levels due to non-reporting. Limited understanding of biology. Long-lived species. Catch allocation issues exist between fishing sectors and information required prior to further development of target fisheries.

4. **Sweep.** Serious catch decline in NSW. Moderate value in the Ocean Hauling Fishery. Not significantly targeted by other fisheries. Limited knowledge of biology. Long-lived species.

5. **Blue mackerel.** High value and catch in the Ocean Hauling Fishery. Stable catch level. Potentially significant quantities taken by other fisheries but uncertainty about total catch levels due to non-reporting. Impact by Commonwealth Small Pelagic Fishery on older fish may by significant. Limited understanding of biology. Probably a long-lived species. Catch allocation issues exist between fishing sectors.

6. **Pilchards.** Very serious catch decline in NSW, at least partly due to environmental factors (massive fish kills due to virus). Short-lived species. High value in the Ocean Hauling Fishery prior to decline. Not significantly targeted by other fisheries.

7. **Silver trevally.** Very serious catch decline in NSW. However, low value and catch level in the Ocean Hauling Fishery. Much higher value and catch in other fisheries. High priority for cooperation in an assessment coordinated by the major targeting fisheries.

8. **Australian salmon.** Historically high value and catch level in the Ocean Hauling Fishery. Not significantly targeted by other commercial fisheries. Stable catch level. Moderate understanding of biology. Significant recreational fishery and so catch allocation issues exist between fishing sectors.

9. **Bream.** Catch decline in NSW, but this is associated with a decline in effort. Stable catch level and high value in the Ocean Hauling Fishery. Higher value and catch in other fisheries. Relatively good understanding of biology.

10. **Luderick.** Slight catch decline in NSW, but stable in the Ocean Hauling Fishery. Moderate value and catch level in the fishery. Much higher value and catch in other fisheries.

11. **Sand whiting.** Moderate value and low catch level in the Ocean Hauling Fishery. Much higher value and catch in other fisheries. Stable catch levels.

12. **Dart.** Low value and catch level in the Ocean Hauling Fishery although catch level is increasing. Not significantly targeted by other commercial fisheries, but may be important to recreational fishers. Limited knowledge of biology. Some confusion in reporting, i.e. ocean hauling fishers may land several species currently reported as "dart".

13. **Sandy sprat (whitebait).** Low value and catch level in the Ocean Hauling Fishery, and not significantly targeted by other fisheries. Limited knowledge of biology. Short-lived species. Some confusion in reporting, i.e. ocean hauling fishers may land several species currently reported as "sprat/whitebait".

14. **Anchovy.** Low value and catch level in the Ocean Hauling Fishery and not significantly targeted by other fisheries. Stable catch level. Short-lived species. Possible confusion in reporting, i.e. ocean hauling fishers may land several species currently reported as "anchovy".

15. **Bonito.** Low value and catch level in the Ocean Hauling Fishery, although catch level is increasing. Much higher value and catch in other fisheries.

16. **Jack mackerel.** Low catch and value in the Ocean Hauling Fishery. Stable catch level in the fishery. Much higher value and catch in Commonwealth Small Pelagic Fishery. Moderate understanding of biology.

ii) Quantification and reduction of landings of non-target species

Species targeted by the Ocean Hauling Fishery tend to occur in coastal waters as mono-specific aggregations. Consequently, fishing is highly targeted and landings of non-target species are small relative to other fisheries. In addition, species targeted by beach hauling fishers tend to occur as schools of mature fish and bycatch of immature/undersized fish is likely to be minimal. Most of the evidence for the above information is anecdotal, however, and the assumptions need to be tested by an independent scientific observer-based study.

Research to quantify and reduce bycatch from general purpose hauling nets has been conducted in NSW estuaries, however, the performance of this gear type has not yet been investigated in ocean waters. Bycatch and discarding by other gear types used in the Ocean Hauling Fishery are also yet to be assessed.

It is proposed that an observer-based study be used to assess bycatch and discarding in the Ocean Hauling Fishery (see management response 1.1(a)). The study will examine the performance of hauling nets and purse seine nets. It is intended that observer surveys be repeated to assess new or modified gear types, but otherwise be repeated periodically (5-10 years) to provide a low level of

bycatch monitoring. Particular bycatch or discarding problems that are identified by observer surveys will be addressed by further targeted research. This may include assessment of the utility of spatial and temporal fishing closures, and/or the development of alternative gear types and fishing practices.

An examination of mesh selectivity in garfish hauling nets is scheduled to occur in 2001/02. This study will determine the most appropriate mesh size to reduce landings of immature fish whilst minimising meshing of larger fish (refer to management response 2.5(k)).

iii) Describing and minimising interactions between fishery and habitat

The impacts on ocean habitats by the Ocean Hauling Fishery are believed to be minimal, but have not been assessed by any scientific study. Habitats that could potentially be impacted include seagrass and algal beds, surf zones, intertidal zones, sand dunes and other beach access points. Physical impacts to these habitats may potentially arise from the use of nets, boats and vehicles by haul net fishers. Purse seine fishing is unlikely to significantly impact on coastal habitats.

It is proposed that an independent observer-based study be used to identify any interactions between habitats and the fishery by cataloguing where and when the fishery uses different gear types. Where interactions are identified, physical impacts on habitat can be assessed by targeted, short-term research, which may include manipulative field experiments (refer to management responses 1.1(a), 8.1 (d) and (e)). If a significant impact is found to occur, further targeted research will be conducted to develop alternative gear types and/or fishing practices that minimise the impact. Alternately, it may be more cost effective to implement small-scale closures that achieve the same objective.

There is a need for tools to monitor biodiversity in the ecosystem in which the fishery operates. The research needed to provide such tools is likely to be long-term and drawing on a variety of expertise and knowledge. This draft strategy is proposing, however, reforms in research and monitoring that will significantly improve the working knowledge of the fishery in its environment. These reforms, such as improvements in the accuracy of catch returns and the knowledge of discards from the observer study, will form the basis for future studies to assist biodiversity monitoring.

h) Compliance

NSW Fisheries has approximately 90 fisheries officers responsible for coordinating and implementing compliance strategies in NSW. These strategies include:

- maximising voluntary compliance
- providing effective deterrence for offences
- providing effective support services.

Approximately 65 of these fisheries officers are located in areas along the NSW coast where the Ocean Hauling Fishery occurs. Their general duties include conducting patrols, inspecting commercial fishers and their gear, and recording rates of compliance.

A compliance strategic plan is to be developed that will provide the direction for education, advisory and enforcement services provided by NSW Fisheries for the Ocean Hauling Fishery (see management response 6.1(a) in section 4 of this draft FMS).

To ensure that compliance service is delivered in a consistent manner, quality inspection guidelines are being developed as part of this operational plan for inspections within the Ocean Hauling Fishery. These guidelines will set out a procedural approach to be adopted when undertaking

inspections of fishers, fishing gear and other related matters to ensure that all issues requiring compliance by commercial fishers under the FMS are being adhered to.

i) A penalty points system

A penalty points scheme with endorsement suspension and share forfeiture provisions will be introduced under this draft FMS and will be developed as part of the share management plan for the Ocean Hauling Fishery (see management response 6.1(b) in section 4 of this draft FMS).

The Ocean Hauling Fishery generally has a high compliance rate, however, despite the relatively large number of potential offences and the maximum penalties specified in the FM Act and Regulation, there are still a small number of ocean hauling fishers who regularly operate beyond the rules. These few people continue to breach the law partly because the courts are unwilling to impose hefty fines for fisheries offences, which are often viewed as minor compared to other criminal offences, and are reluctant to uphold administrative decisions to suspend or cancel a fisher's entitlements. The penalty points system is a way of providing a clear deterrent to fishers who are considering breaching the provisions of the FMS or associated rules.

Similar to the motor vehicle licence demerit points scheme works (administered by the Roads and Traffic Authority), the proposed system would see a list of penalty points assigned to serious or repeated offences. If a fisher accrued enough penalty points by consistently breaching the management rules, the endorsement or licence would be subject to predetermined periods of suspension or cancellation through provisions in the share management plan for the fishery.

The offences deemed as "serious" and the definition of a "repeated offence" would need to be included in the share management plan, as would the points attributable to each offence.

i) Management controls

There are two broad types of fishery management controls, known as input controls and output controls. Input controls limit the amount of effort commercial fishers put into their fishing activities, indirectly controlling the amount of fish caught. They need to be continually modified in response to fishing technology. Input controls can include restrictions on the number of licences, the size and engine capacity of boats, the length and mesh size of nets, and the areas and times which can be worked. Output controls, on the other hand, directly limit the amount of fish that can be taken from the water and are well suited for single species, high value fisheries using single gear types (Goulstone, 1996).

The Ocean Hauling Fishery in NSW is predominantly managed by input controls. The following section sets out in broad terms the controls that apply to activities in the fishery. The specific rules, such as the net length and mesh sizes applying in particular areas, are detailed in Appendix C1 and in the *Fisheries Management (General) Regulation 1995*.

i) Fishing licences

A commercial fishing licence is required by an individual before they can take fish for sale or be in possession of commercial fishing gear in or adjacent to waters. The licence only authorises activities that are covered by the endorsements in respect to each part of the fishery and specified on the licence. Conditions may be placed on licences in order to restrict fisher's commercial activities where required.

Generally speaking, commercial fishing licences are currently available to persons who held a licence immediately prior to the commencement of FM Act, owners of a recognised fishing operation (RFO), or the nominated fisher of an RFO.

This draft FMS proposes to retain the RFO concept under category 2 share management, and using shares allow for structural adjustment at the fishing business level improve the economic viability of fishers. Variations to the Licensing Policy will be made to allow for changes as they are developed.

A commercial fishing licence may also be issued to an individual who is the holder of shares in a share management fishery. This will become the more relevant requirement as the Ocean Hauling Fishery moves to full category 2 share management.

ii) Limited entry

The Ocean Hauling Fishery was recently declared a category 2 share management fishery. Access to the fishery has been limited to eligible fishers since the restricted fishery regime commenced for class A (skipper) and class B (crew) sectors of the fishery on 1 March 1995 and for the class C (purse seine) sector on 1 March 1997.

Initial entry to the Ocean Hauling Fishery under the restricted fishery regime for most methods was defined by having minimum level of catch history (and ownership of relevant net registration/s) showing that the method/s sought in the application had been the activity/ies used over past years. An extensive statutory appeals process followed.

Following changes to the FM Act in December 2000, the Ocean Hauling Fishery, along with most other major commercial fisheries, was selected to become a category 2 share management fishery. Section 6(a) of this draft FMS outlines the process of moving from a restricted fishery regime to a share management regime.

iii) Fishing endorsements

There are now four classes of endorsement in the Ocean Hauling Fishery. The numbers of fishers in each of the three classes of endorsements that existed in May 2001, including class A (skipper), B (crew) and C (purse seine), are outlined within Table B7 in section 5 of Chapter B. Table B7 also highlights numbers of fishers holding one or more of the four possible net authorities that are associated with class A (skipper) endorsements. Class D (northern purse seine) endorsements were first issued in 2001/2.

Under the draft FMS conditions may continue to be placed on endorsements (see management response 2.2(h)). An endorsement condition is currently in place, and will continue under the draft FMS, which prohibits class A and class B endorsement holders from ocean hauling on weekends or public holidays between November and February. Class C endorsement holders are not subject to the weekend closure whist undertaking purse seining activities.

The eligibility to hold endorsements on a commercial fishing licence in a category 2 share management fishery is based on the shareholder holding the minimum number of shares specified in the management plan for the fishery. Different minimum shareholdings may apply to each endorsement or each region in the fishery, or to both.

Section 4 of this draft FMS proposes a number of principles that will be adopted with respect to setting minimum shareholdings in the management plan (see management response 2.2(d)). The

principles relate to having a minimum shareholding at the fishing business level (taking into account shares in other fisheries) for new entrants to the fishery, and at the operational level for the hauling methods of the fishery (i.e. at the level of the hauling team for each method).

It must be recognised that any application of minimum shareholdings in the Ocean Hauling Fishery is a long-term approach to restructuring fishing effort. Unless there is a direct link between share holdings and fishing effort, other management tools (particularly closures) will be needed to achieve any required short-term changes in fishing effort or practices.

iv) Controls on fishing gear and boats

Detailed restrictions relating to the dimensions and type of fishing gear are set out in Regulation. The Regulation provides for the use of 'standard' gear in most areas, but a clearer definition of the prescribed gear in the fishery with proposed amendments is provided in Appendix C1 (see management response 2.1(c)). Appendix C1 also stipulates in many cases how the gear must be operated. This draft FMS proposes to continue the prohibition of individuals interfering with fishing gear set by commercial fishers as provided for under clause 107 of the Regulation (see management response 2.2(h)). The current regulations relevant to the Ocean Hauling Fishery will continue, subject to any changes necessary to implement this draft FMS.

Fishing boat licensing

In addition to each fisher having to be licensed, every fishing boat used in connection with ocean hauling must also be licensed. There has been a cap on the total number of boat licences since 1984 (includes boats used in all fisheries) and this restriction will remain for the duration of this draft FMS.

To prevent the increase in size and therefore efficiency of vessels in the fishery, a strict boat replacement policy exists and will continue under the draft FMS. Boats 5.8 m in length or less may be replaced with boats up to 5.8 m. Boats that are greater than 5.8 m in length may only be replaced with boats that are no more than 10% or one metre greater in length, whichever is lesser. The 10% tolerance continues to relate to the original boat length to avoid a progressive increase in boat length over time.

Engine controls

In early 1997 an attempt to cap escalating effort was made by instituting a closure which limited beach-based ocean hauling fishers to using an engine unit of not more than 45 horsepower. There is concern that some fishers who have complied with the wording of the closure, but not the intent, and have installed higher capacity engines, receiving an unfair advantage over those who have genuinely reduced the power of their boats engines to comply with the closure. Management response 2.2(c) in section 4 of this draft FMS proposes to improve management controls for the engine size on licensed fishing boats in the beach fishery.

Net registration

Commercial fishing nets used in the Ocean Hauling Fishery are required to be registered. Net registration certificates are issued for individual nets and are valid for the life of the net. The certificates stipulate the length and mesh sizes of individual nets.

New (i.e. additional) net registrations have not been issued since a freeze was placed on the registration of new nets in July 1989 and will not be issued under this draft FMS.

Net registrations are not transferable and are only issued for new nets that are replacing existing nets that are no longer serviceable, and must be of the same specifications. Where nets are acquired as part of the transfer of a fishing business (or share transfers), only the nets authorised for use by the new owner's entitlements will be registered. All current arrangements relating to net registrations are proposed to continue under the draft FMS (refer to management response 2.2(h)).

v) National licence splitting policy

The Commonwealth and the State Governments have a long standing nationally agreed policy in place on licence splitting. The policy prevents entitlements held by one person or entity and issued by more than one jurisdiction, from being split and transferred separately. The transfer of a fishing business will not be approved unless all entitlements issued to the business by other jurisdictions are also transferred to the same buyer, or surrendered, or the approval of all agencies involved has been obtained.

Where fishing effort has been historically 'shared' across a number of entitlements held by a person, the policy prevents the increase in effort that would occur by creating two separate entitlements that could operate at full capacity.

This fundamental component of the Licensing Policy will be retained under this draft FMS.

vi) Transfer of licensed fishing boats

The majority of licensed fishing boats used in the Ocean Hauling Fishery are small vessels that have been classified as "general purpose" boats. Boats in this category do not carry validated catch history and can be transferred separate to the other entitlements of the fishing business. In general, boats have been categorised as general purpose vessels where the fisher, rather than the boat, was considered to be the predominant unit of fishing effort.

On the other hand, boats that are categorised as "boat history" vessels cannot be transferred separate to the fishing business. The Licensing Branch can advise a fishing boat owner whether a boat has been classed as a boat history or general purpose vessel. Under the draft FMS any proposal to transfer a fishing boat licence should meet this transfer policy must be submitted to NSW Fisheries for approval.

vii) Transfer of fishing business entitlements

Commercial fishing licences and endorsements to participate in a fishery are not freely transferable. The transfer guidelines, implemented in April 2000, specify whether a new fishing business owner is eligible to hold a class A (skipper) or class B (crew) ocean hauling endorsement upon transfer of the business. Additionally, where the new owner is eligible for a class A endorsement, the guidelines outline the net authorities available upon transfer. Further details and an outline of the current transfer policy is contained within section 5(b)(vii) of Chapter B. The transfer guidelines in place for class A and class B sectors of the Ocean Hauling Fishery will continue under the draft FMS.

While the class A and B sectors are subject to the new transfer guidelines, the class C (purse seine) sector of the fishery remains subject to that part of the Licensing Policy known as the "interim

transfer policy". The interim transfer policy currently provides that the class C endorsement of a fishing business will only become available to the first new owner of the business. If the business is transferred for a second time, the offer to retain the class C endorsement lapses.

These transfer arrangements will be superseded through the implementation of share management provisions and minimum shareholdings for the fishery upon the commencement of the share management plan.

viii) Nomination policy

The three sectors of the Ocean Hauling Fishery are subject to two separate policies in relation to nominations. Under the current general nomination policy, if the owner of a ocean hauling fishing business is eligible for a class C (purse seine) endorsement, the owner may nominate another person to take fish on behalf of the business.

Clause 212N of the *Fisheries Management (General) Regulation 1995* provides for short term nominations for those commercial fishers holding either class A (skipper) or class C endorsements in cases of sickness or other extenuating circumstances.

Following the implementation of the ocean hauling transfer guidelines in April 2000 for businesses with either class A or class B (crew) endorsements, long term nominations are permitted in these sectors of the Ocean Hauling Fishery provided the fishing business meets the criteria set out in the transfer guidelines for the appropriate class of endorsement. This includes the requirement for people without sufficient experience in the fishery to operate in a crew position for a two year period (see section 5(b)(vii) in Chapter B for details of the transfer guidelines).

In all cases, if a person nominates another fisher to take fish on their behalf, that person forgoes their right to fish (under all endorsements) while the nomination is active.

ix) Zoning

The intention of the zoning scheme in 1995 has limited fishers' operations to one of seven regions along the NSW coastline (See Map B1 in section 2 of Chapter B). Exemptions to the zoning rules were provided to boat-based garfish haulers who were identified as 'historical travellers' and all purse seiners as conflict in those boat-based sectors was less common at the time.

In addition to promoting harmony in the fishery, zoning focuses management and research on regional aspects of the biological, social and economic issues affecting the fishery. Local issues can be addressed in a way that meets the requirements of local groups within a state-wide framework.

The zoning scheme will continue under the draft FMS, with the incorporation of all boat-based garfish haulers into the scheme (see management response 2.5(f) in section 4 of this draft FMS). Class D endorsement holders are restricted to waters north of latitude 32° South and will continue to be restricted under the draft FMS. Class C endorsement holders will not be restricted to individual zones under the draft FMS.

x) Time and area closures

The *Fisheries Management Act 1994* provides for the use of fishing closures in the Ocean Hauling Fishery to, among other things:

- protect and conserve areas of key habitat

- manage the amount of fishing effort in an estuary
- manage conflicts between stakeholders over the use of the resource and to ensure it is equitably shared
- minimise bycatch and the impacts of the fishery on threatened and protected species.

Fishing closures can be established on a seasonal, time, area, operator or gear specific basis. There are numerous fishing closures in place in NSW which limit fishing in the Ocean Hauling Fishery. Appendix B2 outlines the closures that impact on ocean hauling operations. The existing fishing closures will remain until reviewed and new closures will be developed in accordance with section 4 of this draft FMS (refer to management response 4.5(a)).

Fishing closures are normally published in the NSW Government Gazette, however if the Minister for Fisheries considers that a fishing closure is required urgently, the Minister may introduce the closure and advise the public through media outlets and by displaying prominent signs in areas adjacent to the waters affected. In the case of an urgent closure, the Minister is to publish the closure in the Government Gazette as soon as practicable.

xi) Permits

Section 37 of the *Fisheries Management Act 1994* allows for permits to be issued for research or other authorised purposes. These permits provide a legal framework for activities that fall outside normal operating rules set out in the Act or its Regulation. Each permit sets out a number of conditions, which vary depending on the purpose of the permit. These conditions ensure that permits are used only for the purpose intended by their issuing and are often used to limit the extent of the permitted activity. The permits that may be issued under this draft FMS are outlined in Table B8 in section 5(b)(xi) of Chapter B.

Permits will be issued to authorise modified fishing practices to assist approved research programs or for purposes consistent with the vision and goals of this draft FMS (see management response 6.4(b) in section 4 of this draft FMS).

Permits are valid for the period specified in the permit, and may be suspended or cancelled at any time by the Minister. Permits are not transferred and are valid only insofar as they do not conflict with approved determinations of native title made under the Commonwealth *Native Title Act 1993*.

xii) Code of conduct

It is now a licence condition of an ocean hauling endorsement that the commercial fisher complies with a code of conduct, which is approved each year before the winter period. Penalties apply for non-compliance. Appendix B3 contains a copy of the code of conduct for 2001/02.

The code of conduct covers issues like vehicle speed limits on beaches, use of agreed access points, avoiding environmental damage and incorporates local arrangements with Councils. It is reviewed and where necessary amended each year in consultation with the Ocean Hauling MAC and in response to issues that arise relating to the operation of ocean hauling businesses (see management response 4.5(b) in section 4 of this draft FMS). The draft FMS proposes to develop a code of conduct, enforceable by conditions on licences, for the purse seine sector of the Ocean Hauling Fishery (see management response 4.5(c)).

xiii) Catch limits and quotas

Section 5 of this draft FMS lists trigger points and allowable commercial catch levels for target species in this fishery. The upper catch trigger level for the commercial catch of each of these species has been determined using the upper trigger point range and recorded annual landings.

A daily bycatch limit applies to Australian salmon north of Barrenjoey Headland and to tailor in all NSW waters taken by commercial fishing nets as follows:

Commercial fishing activity	Daily possession limit per species (kg)
Hauling crew	100
Meshing crew (or individual)	50
Any other licensed commercial fishing vessel containing a commercial fishing net	50

This daily trip limit will continue to apply under the draft FMS (see management response 4.1(b)). Other species based catch controls such as size limits and protected fish are discussed in section 6(e) of this draft FMS.

xiv) Seafood safety programs

Food safety programs which relate to the Ocean Hauling Fishery, are administered by SafeFood Production NSW under the *Food Act 1989.* Food safety programs for all commercial fisheries are currently being prepared by SafeFood Production NSW and will continue under the draft FMS (see management response 5.4(a)).

xv) Recognised fishing grounds

Section 39 of the *Fisheries Management Act 1994* and clause 105 of the *Fisheries Management (General) Regulation 1995* provide for the declaration of waters used for net fishing by commercial fishers as recognised fishing grounds (RFG). The draft FMS proposes to develop recognised fishing grounds in consultation with the community. These areas may include areas of sea or estuaries that have been used historically for net fishing or are used regularly or intermittently for net fishing by commercial fishers (see management response 4.5(d)).

Recognised fishing grounds aim to reduce conflict between user groups by clearly defining the specific areas which have traditionally been used by commercial fishers to take fish and giving priority to commercial fishers in those areas. Priority in areas that have not been declared a RFG will be based on whoever is present at the site first.

Recognised fishing grounds have two purposes:

(1) commercial fishers may request a person to remove anything that has been placed or left by the person, without lawful excuse, and which is obstructing the lawful use of the net fishing activities of the commercial fisher

(2) commercial fishers using nets have priority over recreational fishers in the waters defined as RFG. Boats, surf craft or similar equipment are not allowed to cause the dispersal of schooling fish or fish travelling in a school.

The implementation of RFG does not mean commercial fishers will be excluded from areas that have not been declared a RFG nor does it provide an additional property right in the fishery, they merely provide priority for access to particular areas. Additionally, just because an area has been

declared a RFG, it does not prevent a lawful obstruction, such as a jetty or mooring being constructed. The declaration of a RFG, however, will provide useful information for local Councils and other State agencies when considering development applications and the impact on other user groups.

The process of declaring RFG will involve broader stakeholder input. The initial step will be identification of possible sites by the Ocean Hauling MAC, having regard to guidelines approved by the Minister. Once these sites have been identified, they will be presented to the other relevant advisory councils such as the Advisory Council on Recreational Fishing for consideration, prior to a period of public comment. The Ocean Hauling MAC, prior to final recommendations being submitted to the Minister, will consider any comments made by the community.

Once the FMS is finalised, it will be up to the Ocean Hauling MAC to decide on the extent and scope of any implementation program for RFG in their fishery. The implementation program will need to be financed by an industry contribution determined on advice from the MAC.

xvi) Regional arrangements

In 1995, committees were established on a regional basis to address the issues of equitably sharing resources amongst beach users. The outcome was expected to reduce social conflict and fine tune aspects of the fishery rules in each of the seven regions. NSW Fisheries chaired committees to ensure all relevant groups were represented and the local agreements would be enforced. The committees represented local people considering local issues and arriving at local solutions. Specifically, the committees included representatives from local councils, National Parks and Wildlife Service, recreational fishers, and a variety of community groups.

The specific areas addressed by the regional liaison process include:

- identifying and mapping traditional hauling grounds along beaches (assisting in the development recognised fishing grounds as defined in the Fisheries Management (General) Regulation 1995)
- nominating beach closures for commercial ocean hauling (to reduce social conflict)
- making local amendments to the code of conduct
- identifying the main species targeted in each region.

Draft recommendations from the process and were submitted for regions 1 to 4 and region 7, but draft recommendations were not pursued for regions 5 and 6 due to social conflict in each of these regions at the time. The draft FMS proposes to review the agreements made in 1995 and implement approved recommendations. For regions 5 and 6, it is proposed that the regional liaison process be initiated and developed (see management response 4.5(a)).

xvii) Provisions for unlicensed crew

Unlicensed crew can not currently be employed in the class A (skipper) and class B (crew) sectors of the fishery. The holder of an endorsement in the class C (purse seine) sector of the fishery may apply for an authorisation to employ unlicensed and unregistered crew or may employ a person who themselves are registered as crew. The authorisation is commonly referred to as a 'block licence'.

An application for a crew registration may be refused if the applicant has been convicted of an offence referred to in the FM Act and its regulations. A licensed fisher employing crew must maintain

records about their crew. Information relating to crew must be recorded on the catch return submitted each month by the licence.

The draft FMS proposes to continue the restrictions on the use of unlicensed crew, however the implementation of minimum shareholdings to operate a hauling team proposed in management response 2.2(d) has the capacity to change arrangements for unlicensed crew.

xviii) Special arrangements for skippers and crew

Special arrangements for skippers and crew are in place which allow for certain fishers who would only eligible for a class B (crew) endorsement to be authorised as if they hold a class A (skipper) endorsement. These arrangements are often referred to as 'floating skipper' arrangements. These arrangements only apply when the eligible class A (skipper) endorsement holder of a fishing business is not working as a skipper. For further information relating to floating skipper arrangements please refer to section 5(b)(xviii) of Chapter B.

There are approximately 30 fishers subject to such special arrangements. The arrangements are transitional in nature and therefore lapse when a fishing business is sold. Consideration as to the continuance or otherwise of these special arrangements will need to be considered during the development of the share management plan.

xix) Training licences

Entry into the commercial fishing industry under "father and son" arrangements was replaced in 1995 by clause 135 of the *Fisheries Management (General) Regulation 1995* which provides for trainer and trainee fishing licences. Please refer to section 5(b)(xix) of Chapter B for further information relating to father and son arrangements.

"Sons" (can include daughters) who have continued in the industry with their ocean hauling endorsements remaining attached to their father's fishing business (under the old father and son arrangements), can maintain their ocean hauling endorsement. Should "sons" decide to transfer their ocean hauling endorsements, they may be transferred separate to the "father's" fishing business. Like all other ocean hauling fishers, however, the availability of the endorsement to a new owner upon transfer is subject to the relevant transfer criteria.

Licences are now available to eligible persons for the purposes of training a new entrant to the commercial fishing industry. There are two types of training licence currently available:

Trainer's licence: The seller may apply to continue to hold his/her fishing licence for up to one year from the next fishing renewal date, to work with the purchaser of the fishing business for training purposes (but the business must qualify as a RFO), subject to the entitlements of the fishing business, on the understanding that the licence is surrendered at the end of the one year period unless a further RFO is acquired which is not the original business.

Trainee licence: Within six months of acquiring a RFO a new entrant may request that the RFO be placed into abeyance whilst the owner works with an experienced fisher to gain the necessary skills. This arrangement may apply for a period of up to two years. Fishing methods which the new entrant can use are restricted to the entitlements held by his or her fishing business. Areas which can be worked by the new entrant are limited to areas included in the purchased RFO and areas of historic operation of the experienced fisher.

xx) Controls on collection of bait-for-own-use

The fishery for bait for own use is largely carried out under permit by fishers who will target tuna in fisheries managed by the Commonwealth. There is also some targeting of tuna within NSW jurisdiction that also uses bait gathered by lift nets. These bait gathering activities have always been constrained to three species; yellowtail scad, blue mackerel and pilchards. NSW fishers using a lift net to gather bait have been required to report on bait used since 1997 but Commonwealth permit holders have had no reporting requirements.

This draft FMS proposes development of a management system for bait gathering using purse seine and lift nets (see management response 2.2(e) and (f)). This system must be negotiated with the resource harvest sectors and the Ocean Hauling MAC. The new policy will provide for the following:

- inclusion of permit holders in an appropriate code of conduct as a permit condition
- inclusion of permit holders in any observer programs required for the Class C (purse seine) sector
- development of an appropriate reporting system for permit holders to document all bait harvest
- a cap on the maximum number of permits that can be issued and a means of offering those permits by tender to all Commonwealth tuna fishers
- a means of adjusting the number of permits to reflect both the sustainability and environmental needs of the fishery as well as the demand for access to the resource
- refine the definition of the purse seine gear or other controls to reflect the need to collect live bait only and discourage the collection of baits that could be purchased from NSW class C (purse seine) fishers
- determination of the need and suitability of using lift nets in place of purse seine nets for bait gathering.

j) Administration

i) Renewal of licences and permits

Commercial fishing licences and fishing boat licences must currently be renewed annually. Fishers are sent renewal application forms approximately one month before the expiry date on the licence. If a commercial fishing licence is not renewed within 60 days of the expiry date on the licence, the renewal application is generally taken to be an application for a new licence. Additional fees apply to late renewal applications (see below).

Abeyance period for fishing boat licences

Fishing boat licences can be held in abeyance for a period of up to two years from the date of expiry of the licence. Owners may also provide written advice that a boat licence is to be placed in abeyance. Fishing boat licence fees are not payable during the period of abeyance, but the full amount due is payable if the licence is reinstated within the two years specified.

ii) Fees

A number of fees are payable in the Ocean Hauling Fishery. An outline of the cost recovery policy and a summary of the fees follows.

Cost recovery policy

NSW Fisheries recoups costs that are attributable to industry through a cost recovery policy. Cost recovery is a common principle among Australian commercial fisheries and an important component of Ecologically Sustainable Development.

NSW Fisheries is in the process of implementing cost recovery in a progressive manner, so that all charges are not passed on to industry immediately. The FMS Act requires that in a share management fishery, the fees payable must be paid in proportion to the shareholdings in the fishery.

In November 2000, the Government announced a new cost recovery policy. As part of the second reading speech for the *Fisheries Management and Environmental Assessment Legislation Amendment Act 2000*, the Minister for Fisheries, the Hon. Eddie Obeid, gave the following commitment for the fisheries that were moving to category 2 share management fisheries:

"Over the next five years the Government will develop and implement a cost recovery framework for category 2 share management fisheries. This framework will be subject to extensive industry consultation."

"During this period, the total amount of money collected for NSW Fisheries, for its existing management services, will not increase without the support of the relevant management advisory committee."

"After five years, the costs that have been identified as attributable to the industry will be progressively introduced over a further three-year period."

It is important to note that the new services required to be implemented under the FMS or as a result of the environment assessment process will need to be fully funded by the fishery participants. It is estimated that the additional fees that would apply to industry to cover the costs of implementing this strategy (including the observer-based survey) will be between approximately $300 and $700 per fishing business per year. An exact estimate is not known because the number of endorsed fishing businesses will change, there will be opportunities for contestable service delivery and the cost of the final FMS approved by the Minister for Fisheries is unknown at this stage.

This draft FMS includes an outline of the charges that apply in the fishery at the time of the FMS preparation and an indication is given of likely further changes in charges. The FMS does not, itself, set the charges, or limit or other govern the way charges are changed. It is not necessary to amend the FMS in order to effect changes to any particular charge described here.

Commercial fishing licences

The following fees are payable on application for issue or renewal of a licence:

New licence application	
Fee	$416
Contribution to industry costs	$208
FRDC research levy	$115
Licence renewal received within 30 days of expiry	
Fee	$208

Contribution to industry costs	$208
FRDC research levy	$115
Unlicensed crew (class C and D only)	$52

Licence renewal received more than 30 days after expiry

Fee	$312
Contribution to industry costs	$208
FRDC research levy	$115

Fishing boat licences

The following fees are payable on application for renewal of a fishing boat licence:

Renewal application lodged within 30 days after licence expiry:

Boats not greater than 3 metres in length……$ 42

Boats in excess of 3 metres in length according to the scale hereunder:

Boats over 3 metres but not over 4 metres……..$ 63

Boats over 4 metres but not over 5 metres……..$ 84

Boats over 5 metres but not over 6 metres……..$105

Boats over 6 metres but not over 7 metres……..$126

Boats over 7 metres but not over 8 metres……..$147

Boats over 8 metres but not over 9 metres……..$168

etc… for each additional metre or part thereof, add an additional $21

Renewal application received over 30 days after licence expiry:

Boats not greater than 3 metres in length……$145

Boats in excess of 3 metres in length according to the scale hereunder:

Boats over 3 metres but not over 4 metres……..$166

Boats over 4 metres but not over 5 metres……..$187

Boats over 5 metres but not over 6 metres……..$208

Boats over 6 metres but not over 7 metres……..$229

Boats over 7 metres but not over 8 metres……..$250

Boats over 8 metres but not over 9 metres……..$271

etc… for each additional metre or part thereof, add an additional $21

The fee to replace an existing licensed boat with a new boat is approximately $104, plus the cost of the new boat licence fee, which depends on the length of the boat.

Net registration

Replacement net registration certificates will continue to be issued at local NSW Fisheries Offices. The fee for replacement of an existing net registration is $21.

Share management fishery rental charge

The *Fisheries Management Act 1994* provides that a rental charge of $100 applies to shareholders in a category 2 share management fishery (irrespective of the number or type of shares held). This charge applied from the commencement of category 2 share management fisheries on 23 March 2001 and will continue under the draft FMS and will be annually adjusted in line with inflation.

Environmental impact assessment charges

Arrangements have been made under Part 5 of the *Environmental Planning and Assessment Act 1979* for recovery of the costs associated with the preparation of the Environmental Impact Statement (EIS). The EIS charge is payable annually for three years and commenced on 1 July 2001. There is a charge of $150 for the first two fisheries in which the person is eligible to hold shares, and $100 for each fishery thereafter.

A charge of $80 is also payable to contribute to the costs incurred in arranging for the Fisheries Resource Conservation and Assessment Council (FRCAC) to perform its functions in relation to the EIS, commencing from 1 July 2001.

Fishers have the option of paying these charges and the share management fishery rental charge in one or in four instalments over the course of each year.

These charges will be adjusted annually in accordance with inflation.

Research levy

An annual fee of $115 is collected upon commercial fishing licence renewal and paid directly to the FRDC to support funding of fisheries related research programs around Australia. The FRDC support a number of research programs relating to the Ocean Hauling Fishery in NSW. Further details on these programs can be found in the research section of this draft FMS.

This charge will be adjusted annually in accordance with inflation.

Endorsement application fees

The ocean hauling endorsement application fee is paid on an annual basis for fishers to maintain their ocean hauling endorsements. Generally, when the annual fee is not paid, the endorsement will not be allocated to the business for the new ocean hauling season (see management response 2.3(b)).

Annual fee for a class A (skipper) endorsement	$260
Annual fee for a class B (crew) endorsement	$52
Annual fee for a class C (purse seine) endorsement	$260

A maximum fee of $291 applies to those fishers with both class A and class C endorsements.

These charges will be adjusted annually in accordance with inflation.

Other transaction fees

There are several other fees payable in the fishery to cover the costs of individual licensing transactions, however, these only apply to the persons utilising the particular services. An example of this type of fee is the $260 fee payable for the transfer of a fishing boat licence.

These charges will be adjusted annually in accordance with inflation.

iii) Appeals mechanisms

Fishers may lodge an appeal to the Administrative Decisions Tribunal (ADT) against a decision to refuse to issue or renew, suspend, cancel or place conditions on a commercial fishing licence (or an endorsement on that licence) or a fishing boat licence.

The main role of the ADT is to review administrative decisions of NSW government agencies. To lodge an appeal with the ADT, a request must first be made to NSW Fisheries for an internal review of the decision, then a written application should be lodged with the ADT no more than 28 days after the internal review was finalised.

The ADT can make various orders concerning an appeal application including:

- upholding the original decision
- reversing the decision completely or in part
- substituting a new decision for the original decision
- ordering the agency to reconsider the decision in light of the ruling.

For further information, refer to the *Administrative Decisions Tribunal Act 1997* or the following website: http://www.lawlink.NSW.gov.au/

k) Consultation

There are a range of consultative bodies established in NSW to assist and advise the Minister and NSW Fisheries on fisheries issues. There are committees that are established to provide advice on specific issues as well as bodies that advise on matters which cut across different fisheries or fishing sectors.

i) Management advisory committees

Share management and major restricted fisheries in NSW each have a management advisory committee (MAC) that provides advice to the Minister for Fisheries on:

- the preparation of any management plan, strategy or regulations for the fishery
- monitoring whether the objectives of the management plan, strategy or those regulations are being attained
- reviews in connection with any new management plan, strategy or regulation
- any other matter relating to the fishery.

Table B13 in Chapter B details the current membership on the Ocean Hauling MAC. The industry members of the MAC comprise representatives that are elected by endorsement holders in the fishery (or shareholders in the share management fishery). There is an industry representative from each of the seven coastal regions in the fishery. The members hold office for a term of three years, however the terms of office are staggered and the terms of half of the industry members expire every 18 months.

The non-industry members on the MAC are appointed by the Minister for Fisheries and also hold terms of office for up to three years. To ensure that all issues discussed by the committee are fairly represented, the MAC is chaired by a person who is not engaged in the administration of the FM Act and is not engaged in commercial fishing.

Although the MAC receives advice from NSW Fisheries observers on research, compliance and administrative issues relating to the fishery, only members of the MAC have voting rights on the decisions of the MAC.

The actual composition and role of the MAC is set by the FM Act and its regulations and may be altered from time to time.

There are many references in this draft FMS to consultation with the Ocean Hauling MAC. Consultation involves seeking the advice of the MAC on their views. The MAC generally meets at least twice a year- but many issues may require resolution urgently, and it may not be practicable to defer consultation to a face-to-face meeting of the MAC. For this reason, references to consultation with the Ocean Hauling MAC in this draft FMS may include the distribution of documents to individual members by a specific date. NSW Fisheries may then compile the comments received into a single document recording the views of MAC members. This document may then be used as a basis for further decision making by NSW Fisheries and/or the Minister for Fisheries.

ii) Ministerial advisory councils

Four Ministerial advisory councils are currently established under the *Fisheries Management Act 1994*. The councils provide advice on matters referred to them by the Minister for Fisheries, or on any other matters the councils consider relevant. They report directly to the Minister.

The Ministerial Advisory Councils currently established are:

- Advisory Council on Commercial Fishing (ACCF)
- Advisory Council on Recreational Fishing (ACoRF)
- Advisory Council on Fisheries Conservation (ACFC)
- Advisory Council on Aquaculture (ACoA)

The Ocean Hauling Fishery and each of the other major share management and restricted fisheries have representatives on the ACCF. These representatives are nominated by each of the respective management advisory committees and appointed by the Minister.

Representatives from the commercial fishing industry in NSW, or people who in the opinion of the Minister have expertise in commercial fishing are also represented on the ACFC.

The name and composition of the Ministerial advisory councils are determined by regulations under the FM Act and may be altered from time to time.

iii) Fisheries Resource Conservation and Assessment Council

The FRCAC has been established to play a key role in advising the Government on fisheries conservation and assessment throughout the State. The members on the council represent a wide range of interests and includes representatives from commercial fishing, recreational fishing, fish marketing, the fishing tackle industry, charter boat fishing, regional tourism, academic expertise, conservation, aquaculture and Indigenous peoples.

The FRCAC advises the Minister for Fisheries on the preparation and revision of fishery management strategies for fishing activities, including this strategy for the Ocean Hauling Fishery.

The legislative role of the FRCAC includes providing advice on:

- the preparation or revision of a fishery management strategy (and for that purpose to review the environmental impact statement prepared in connection with a draft fishery management strategy)
- other matters as may be referred to it by the Minister.

In summary, the FRCAC's duties involve:

- fostering relationships between community groups, recreational fishing interests, commercial fishing interests and government agencies
- advising on the preparation and revision of fishery management strategies
- reviewing environmental impact statements prepared in connection with draft strategies
- providing an opportunity for key stakeholder groups to have input into issues papers prepared for recreational fishing areas selection processes
- reviewing community consultation reports that arise from the recreational fishing area selection process.

Both the FRCAC and the ACCF are consultative bodies that facilitate cross-sectoral and cross-fishery consultation, respectively

l) Share management plan

A share management plan for the Ocean Hauling Fishery will be prepared as part of the transition of the fishery to a full share management regime. The share management plan for the fishery will be consistent with the goals and objectives of this draft FMS. Further discussion of the relationship between a share management plan and this draft FMS is presented in section 1 of this chapter, and information relating to the transition of the Ocean Hauling Fishery to full share management is provided in section 6(a) of this draft FMS.

CHAPTER D. CONSIDERATION OF ALTERNATIVE MANAGEMENT REGIMES

1. Outline of Feasible Alternative Management Regimes

This chapter highlights a range of high-level alternates to the proposed harvest strategy described in the previous chapter. There are two significant alternatives however, that are not presented in this chapter, however. The first of these is the option of not changing the management of the fishery from its' present set of arrangements. This management structure is presented in Chapter B. The final section of Chapter B also presents a review of the fishery and a discussion of the issues where improved management is warranted. A second major alternate to the proposed harvest strategy is the "no fishery" option where all ocean hauling activities cease operation. The discussion of this option is best understood in the context of the justification of the proposed harvest strategy and appears in Chapter I.

a) The alternative management regime paradigm

The draft Ocean Hauling Fishery Management Strategy (FMS) contains eight goals, each with several objectives and many more management responses. There are also more than a dozen types of management tools which could be used (see Table D1). All of these may be used in different combinations to control the impacts of fishing activities. With this large array of management responses and tools, there are an almost infinite number of alternative management options.

With this in mind, alternatives to the proposed FMS can only meaningfully be considered at the higher policy level rather than the level of individual management responses. Also note that as the goals and objectives of the proposed FMS address the major issues in the fishery irrespective of the management measures applied, they are left unchanged for the discussion that follows.

Consequently, this chapter discusses broad alternatives for managing each of the issues that have arisen from the review of the existing operation of the fishery in Chapter B. For further discussion on the proposals in the draft FMS for addressing each management issue refer to section 3 of Chapter C.

b) Managing the Ocean Hauling Fishery using a higher proportion of closures and/or reserves

The management of the Ocean Hauling Fishery includes many existing and proposed closures, including temporal closures (e.g. the proposed weekend closure for garfish hauling) and spatial closures (e.g. the agreed closures proposed under the regional liaison process.)

This section considers an alternate to the use of reserves and closures currently proposed in the harvesting strategy, where closures are used to a much greater extent and may be used in place of other management measures.

The efficacy of large closures in helping to conserve ocean hauling target species would be likely to vary among species. Many of the species targeted on ocean beaches are caught while migrating. The reduction in vulnerability of those species to fishing will depend on the size of the closure and how patterns of fish movement relate to their placement. The majority of species, those that are not caught in a part of a migration, would receive a greater degree of protection. Obviously, the scale and placement of individual closures would be very important in determining the protection they provide to species in the fishery. There is probably insufficient understanding of movements of species caught in that manner (mainly sea mullet, bream, luderick) to predict the value of closures of different sizes, although any closure should have some effect.

The impact of spatial closures can be uneven when there is a strong regional component to the fishery. Within the Ocean Hauling Fishery, spatial closures would have to take account of the regional management structure. All sectors of the Ocean Hauling Fishery (except purse seining) are or will be constrained to operate in a single region. Many ocean hauling teams traditionally work the same beaches and do not work on all beaches in their region. This means that even if spatial closures can be equitably distributed among regions, the effect on hauling crews within each region would vary.

The Ocean Hauling Management Advisory Committee (MAC) has suggested that species-based closures be the first response to a need to reduce fishing effort. Such closures are likely to be effective in reducing fishing effort on single species because of the targeted nature of ocean hauling methods. Alternately, the effectiveness of large-scale spatial closures or permanent reserves is likely to be variable among ocean hauling methods and target species. This is because some ocean haul fishing takes place on mobile aggregations of fish and the effectiveness of the closure will depend on its spatial scale.

Setting aside large areas protected from ocean hauling would require restructuring in the fishery, unless increased fishing effort in areas outside the closed areas was considered acceptable. The areas remaining available to the fishery would still require appropriate management, albeit at a reduced scale. It is not obvious which management programs in the Ocean Hauling Fishery could be reduced or dropped if replaced with a system of extensive closures. The need would remain to provide assessments of target species and other appropriate scientific advice to fisheries managers. It is unlikely that management controls on effort, gear etc. could be reduced or lifted and management controls on ocean hauling fishing businesses would remain. Extensive closures would, however, provide a great degree of certainty that risk of ecosystem and habitat impacts from the fishery were greatly reduced.

c) Alternatives to addressing key management issues within the fishery

i) Alternate regime for managing the impact of the fishery on species and communities not targeted by the fishery

The effect of the fishery on species and communities not targeted by the fishery includes impacts due to bycatch, impact of the fishing gear and operations on habitats and interactions with protected species. Impacts in all of these areas are believed to be minimal but are not supported by any quantitative information. For each of these issues, the general approach proposed in the draft FMS is similar; i.e. to gather information on the impacts and to provide an adaptive framework to react appropriately to the results of studies. Until the information becomes available, there are no effective alternatives to those proposed in the draft FMS.

Table D1. Types of management tools available to control fishing activity.

(Source: adapted from DUAP, 2001)

Type of control	Management tool
Limiting who has access	***Limited access regimes*** can be used to limit entry to participants in a particular fishery or part of a fishery. They usually include eligibility rules and rules relating to the transfer of entitlements
	Restructuring programs can provide a concentrated or focused change in management procedures to achieve an accelerated change in expected outcomes . These may include minimum entitlement holdings, buy back schemes and restructuring through transferability programs
Limiting where and when the fishing can occur	Fishing closures which restrict commercial and/or recreational fishing for a specified period of time, any fishing or fishing for certain classes of fish in any waters or from specified waters
	Marine protected areas in estuarine or oceanic areas managed to conserve biodiversity and habitat. These include aquatic reserves, marine parks and marine components of national parks and nature reserves (Note: fishing restrictions may only apply in certain zones in marine parks and aquatic reserves)
	Recognised fishing grounds are areas used regularly or intermittently for net fishing by commercial fisheries and which have been mapped and approved by the Minister for Fisheries and where commercial net fishers are given priority under clause 105 of the *Fisheries Management (General) Regulation 1995*
	Planning controls in Environmental Planning Instruments (eg LEPs) under the *Environmental Planning and Assessment Act 1979* that could limit where fishing could occur, but only upon the approval of the Minister for Fisheries
Input controls limiting the equipment used to take fish	***Gear restrictions*** limit the size and type of gear (in possession or that can be used to take fish) such as: • size and number of nets/traps/lines/etc • mesh or size configurations, • gear design, and • marking of gear
	Boat controls limit the size and engine capacity of boats
Output controls limiting the amount and type of fish able to be landed	***Total allowable catch*** (TAC) is a specified total catch for a fishery determined by an independent Total Allowable Catch Setting and Review Committee, fished on a competitive basis or by people holding individual quotas
	Species size limit restricts the minimum size, maximum sizes or range of sizes specified for fish of a particular species that can be landed (by measurement or weight)
	Bag limit is the maximum quantity of fish of a specified species or of a specified class that a person may take on any one day – daily limit
	Possession limit is the maximum quantity of fish of a specified species or specified class that a person may have in possession in any specified circumstances
	Protected fish are certain species of fish completely prohibited from being in a person's possession.
	Protected fish from commercial fishing are certain species of fish completely prohibited from commercial fishing and from being taken for sale
	Quality assurance controls are the controls on the harvest of shellfish such as mussels and pipis to protect health

ii) Alternate regimes to ensure sustainability of target species

The draft FMS proposes various input controls and other measures to ensure stock sustainability. The controls primarily restrict the number of fishers able to operate in the fishery, where, when and with what gear they may operate, as well as size limits and maximum fishing effort levels. Other measures in the draft FMS include gathering further information to improve assessment of fish stocks and stronger compliance programs. A more comprehensive discussion on these proposals can be found in section 3 of the draft FMS.

Two feasible alternatives to the proposals in the draft FMS that may be used to achieve stock sustainability through alternate management structures include:

1) managing the fishery using output controls, specifically a total allowable catch (TAC)

2) using a different suite of input controls to those proposed in the draft FMS.

The first alternative to the proposals in the draft FMS is to use output controls to manage the fishery, predominantly a TAC. To properly consider the use of output controls as an alternative in the Ocean Hauling Fishery, it is important to understand the fundamental differences between input and output controls.

The difference between input and output controls

Input controls limit the amount of effort fishers are able to apply to take fish in the fishery, thereby indirectly controlling the catch. Input controls can be as broad as limiting the number of people that can fish or as specific as prescribing the allowable length and mesh size of a net. Input controls aim to reduce fishing "capacity" which has been described by Greboval and Munro (1999) as the ability, or power, of a vessel or a fleet (or in the case of the Ocean Hauling Fishery, a team) to generate fishing effort per period of time.

Output controls on the other hand directly limit the amount of fish that can be harvested (usually of a particular species). Output control regimes can vary from setting a TAC for an entire fish stock with individually allocated and tradeable quotas, to setting a maximum daily limit on catches which applies equally to all operators in a fishery.

Assessment of feasibility of a total allowable catch for a fishery

There are a number of factors that should be considered when determining the applicability of a fishery or a species to an output control regime. Each of these factors is discussed below and particular reference is made to the conditions of the Ocean Hauling Fishery in relation to each factor.

Jurisdictional issues

Quota management of species managed by more than one jurisdiction is most successful if there is an arrangement to coordinate management, perhaps with an overarching TAC. While TACs can be successfully set across jurisdictions, the allocation of the TAC between parties can sometimes result in conflict. For example, the recent disputes between Canada and the US over the allocation of Fraser River salmon stocks is indicative of cross-jurisdictional management issues in fisheries (Christy, 2000).

Ideally, quota management of species taken by multiple jurisdictions requires coordinated management between agencies and fisheries. This points to the need for complementary management arrangements for these species. While the management of a fishery by input control is most effective

when management arrangements are coordinated across jurisdictions, there is still a need to monitor global catches if the total resource is to be protected.

A number of the species caught in the Ocean Hauling Fishery are caught in other NSW fisheries and in fisheries outside NSW jurisdiction (e.g. bream in the Estuary General Fishery, blue mackerel in the Commonwealth Small Pelagic Fishery and sea mullet in the Queensland beach haul fishery). The application of a catch quota on such species would need serious consideration of the management arrangement in these other fisheries and other jurisdictions to ensure that the catch quotas were having the desired outcome on those resources. Additionally, if the value of the catch of a species differs substantially between areas, seasons and/or methods, the impact of a TAC would affect different fisheries to different extents.

Target species and gear types

Fisheries that target more than one species or use more than one gear type are generally more difficult to manage under a quota control system than fisheries with only one or few target species. If the methods used to target a species of fish also catch other species the harvest rate of the other species needs to be carefully monitored and controlled to ensure that they are not over-exploited. The mismatch between quota levels among species targeted by the same gear can lead to discarding, due to high-grading or over-quota catches. High-grading is the practice of discarding lower value fish of a particular species when a price premium is paid for higher grades (e.g. different sizes) of that species. Over-quota catch is when fishers in multi-species fisheries will sometimes find themselves in a position where their quota for a particular species is exhausted. If the species in question is an incidental catch of other target species, the fisher, if intending to continue fishing, faces either having to purchase or lease additional quota or discard. The availability of quota on the quota market and its price are critical factors which influence the decisions of fishers whether to trade or discard those species (Kaufmann *et al*., 1999).

Most fishing done in the Ocean Hauling Fishery is relatively targeted and the species likely to be caught is known, even using methods like the general purpose haul net. This means most of the difficulties occurring in quota managed fisheries relating to mixed catches would not be a problem for the Ocean Hauling Fishery. For example, sea garfish are caught in only small quantities outside of the Ocean Hauling Fishery and are only targeted by a single gear type within the Ocean Hauling Fishery.

Level of catch, value, and management costs

High value fisheries with low production volumes are more suited to quota management than low value and higher volume fisheries, due largely to the increased costs involved.

The financial costs of quota management regimes varies from fishery to fishery, however, evidence to date suggests that management costs under quota management schemes might be higher than alternative management strategies (Kaufmann *et al*., 1999). The higher costs could be attributed to generally greater levels of catch reporting, checking and administration needed in quota systems compared to input controls.

The key fish species taken by the Ocean Hauling Fishery are relatively low value - high volume species. Garfish, whiting and bream are the only species that regularly achieve a relatively high market value. The costs involved in supporting quota management of these or other species in the Ocean Hauling Fishery are likely to be a significant increase relative to the gross annual value of landings for these species.

Number of participants

A quota management scheme is more easily applied to fisheries with a small number of participants. This enables the catch to be more easily monitored and reduces the cost of administration and compliance. A small or easily definable recreational fishery is also desirable due to the extensive monitoring requirements and the need to factor recreational catches into the TAC setting process.

Currently, there are around 374 fishing businesses with endorsements to operate in the Ocean Hauling Fishery. Some of the endorsements within the Ocean Hauling Fishery are held by relatively small numbers of businesses. For example, endorsements to use purse seine nets, garfish hauling nets or pilchard, anchovy bait nets number in the tens, rather than hundreds.

Preliminary data from the National Recreational and Indigenous Fishing Survey conducted in 2000/01 indicates that approximately 18% of the NSW population (approximately 1.1 million people) go recreational fishing at least once a year. Other survey data suggest that some ocean hauling target species are also targeted by recreational fishers. The draft FMS contains a proposal to assess, as far as practicable, the size of the non-commercial harvest and such an understanding is critical to the success of quota-based management for shared species.

Number of ports of landing

The enforcement of a catch quota system is likely to be easier in fisheries where a limited number of ports or places of landing are used to land the catch. Ocean hauling fishers are permitted to operate on many ocean beaches along the NSW coast and boat-based fishers have no restrictions on landing points. The high number of locations that catches are landed at would make the compliance activity to test landings records particularly difficult.

Scientific understanding

The greater the level of scientific understanding of a species, the higher the level of confidence that can be attributed to any management regime designed to ensure sustainable harvest levels. To be able to confidently estimate a biological sustainable harvest for any fishery, a good knowledge of the biology and population dynamics of the species is required. However, quota management can place extra demands on research and monitoring of stock and catch composition.

Species with a biology that leads to dramatic changes in abundance will have different information needs under quota management compared to a species with more stable population dynamics. This is because the process of changing the TAC to adapt to changes in abundance needs to have timely information so that the adjusted TAC can efficiently reflect the changes in abundance. One of the best methods to do this is to have some sort of pre-recruit index of abundance such as used in the New Zealand Hauraki Gulf snapper fishery (Francis, 1993). Such indices provide a forecast of recruitment to the fishery and allow for efficient adjustment of the TAC prior to changes in abundance of the fished stock. Recruitment indices, or other timely measures of future fishable stock, allow efficient TAC setting but are difficult to develop and may be expensive to maintain.

For a species with very dynamic abundance changes, timely information may be essential to allowing a TAC to work at all. This is because an inappropriately high TAC can lead to quota "chasing", where the TAC can be seen as a target to be achieved. Fishing effort may not react as quickly to signs of low abundance when a TAC has not been achieved. In the Ocean Hauling Fishery, blue mackerel is a species expected to have such a life history, with large inter-annual changes in abundance that could create a difficult problem in setting a TAC.

Enforcement issues

Enforcement of quota systems generally rely on a "paper trail" to assist with audits of landings reports. These types of enforcement schemes may include specified landing locations, complex weighing requirements, tagging, logbook schemes and regular compliance audits.

For input control schemes, more on-water enforcement or vessel monitoring systems are likely to be required as limitations on gear and vessel restrictions are introduced. Enforcement of input controls involves a high level of field work and requires sufficient resources to ensure the mobility and safety of Fisheries Officers. In theory, enforcement of quota schemes reduces the level of field work required by providing a paper trail to monitor catches, and through other measures such as the pre-notification of time and place of landings.

As the majority of compliance training and day to day duties in this fishery presently involves the enforcement of input controls, it would be necessary to re-focus training on the development of new skills to enforce catch controls in any new fisheries managed by quotas.

Management issues

Management and administration of quota systems involves significantly more effort than input controls. In particular, there is a need to maintain accurate and auditable records of quota transactions, and for monitoring of the quota system paper trail. For example, there is significant administration associated with the annual distribution of around 180,000 lobster tags in the quota managed NSW Rock Lobster Fishery. The administration and funding of the TAC Committee, which is required to recommending the level of the TAC for the commercial sector for species under quota management, is another specific cost.

Level of industry support

In order for quota management to be successful, the support of participants is important. There has been a mixed reaction to the application of quota management by commercial fishers in different fisheries. In some fisheries, such as abalone, there has been strong support by fishers for quota management.

The current level of support for a quota management scheme in the Ocean Hauling Fishery is unknown, but is unlikely to differ substantially from the recommendation of the Ocean Hauling MAC in April 1998, made in accordance with the Division 1A of Part 8 of the *Fisheries Management (General) Regulation 1995*, which sought to retain input controls as the primary management mechanism in the fishery.

Alternative input controls

An alternative way of ensuring sustainability of target and bycatch stocks with input controls is to significantly reduce the number of participants and the area able to be used in the fishery through fishing closures. This alternative is similar to the approach being adopted in the declaration of recreational fishing areas in NSW, except that process is aimed primarily at promoting recreational fishing opportunities (rather than ensuring stock sustainability) and compensation is therefore being offered to commercial fishers for entitlements that are surrendered as a result of declaring such areas.

Benefits to stock sustainability from a reduction in fisher numbers and a decrease in the area of the fishery would only become apparent if they were complimented by measures to prevent the stocks

remaining from simply being caught by other users of the resource. The benefits of such a change however, need to be weighed against the likely economic and social costs.

The relationship between the number of fishers and catchability is not likely to be linear. Due to the range of controls on the gear used and the area and time able to be fished, there is a point (yet undefined) where even with a surplus of available stocks, fishing businesses operating at full capacity would be unable to increase their individual catches. If fisher numbers are reduced after this point, individual profitability is likely to decrease, as the management costs for the fishery would be shared amongst fewer businesses.

There is also a risk that substantially reducing the number of fishers could affect the viability of regional support structures, such as small fishing depots or cooperatives, registered fish receivers, cold storage facilities and transport arrangements. Creating a lesser need for these services may adversely affect the infrastructure needed by remaining fishers to supply fish to the community.

Stock sustainability benefits from closures would, as previously discussed, vary on a species by species basis depending on biology, movements and population dynamics of a species. To achieve a specific outcome for a species, some closures may include a combination of elements by restricting the use of certain gear types or during certain times of the year. Increasing or broadening the effect of that type of closure may not enhance the outcome any further. An example of this would be extending regulations aimed at the harvesting of spawning fish beyond the time of the spawning activity.

The likely success of species based closures depends on the species and the target methods. However, ocean hauling methods would generally lend themselves to species-based closures because of the degree to which target species can be identified. The Ocean Hauling MAC has recommended that species based closures be used, but only for relatively short-term (up to several years) management of sustainability issues. Other programs, such as marine protected areas are used, in part, to provide protection of this nature and indirectly assist in achieving stock sustainability.

iii) Alternate approaches to enhancing the description of the fishery (area, gear and target species)

New management initiatives which address this issue largely take advantage of existing management structures by adding to them and making the operation of the fishery more clear. There are three areas where the draft FMS makes significant change to the operational definitions used in the fishery: the gear and how it is used; the areas closed to fishing and to be considered for designation as recognised fishing grounds, and the species which may be targeted by each of the methods in the Ocean Hauling Fishery.

The use of gear in the fishery

The alternate strategies to the proposals dealing with fishing gear and how it is applied are a matter of degree – from not changing existing gear regulations to defining every aspect of fishing gear and how it used. The approach taken in the draft FMS has been to constrain gear definitions in the fishery to existing operational bounds where there were previously no defined limits (for example, in the maximum allowable length for some nets). This approach was used to stem the opportunity to use fishing gear in ways that were not common now or in the past. For example, it is technically legal to retrieve a garfish hauling net to a vessel under power. As far as anyone knows, this is not ever done. The proposed FMS prevents such a shift in activity and many other seemingly unlikely possible uses of fishing gear.

There may be advantages in having every aspect of all nets used in the Ocean Hauling Fishery specified in every dimension. For example, there would be little question about whether a given net met the specification, making gear compliance simpler. However, further restrictions on the range of nets allowed in the fishery may also impose an unwarranted cost on fishers. For example, most restrictions on the mesh size used in nets are ranges, rather than a specific size. This is because a fisher may have several different general purpose hauling nets (for example) to suit different types of target fishing. Further refinement the gear definition would restrict the flexibility to use the most appropriate mesh size for the species to be targeted. There would also be costs involved with forcing gear to be rebuilt to meet new specifications.

Areas fished

The greatest change in areas proposed to be fished by the draft FMS comes from implementing the outcomes of negotiations undertaken during the regional liaison process. An alternate system of widespread closures, especially one that provided for significantly greater amount of closed area, would have to be undertaken with a consultation process that would necessarily be very similar to that used in the regional liaison process. This process would be costly and time consuming (the first negotiations alone took over a year) and the benefits that would arise from re-negotiated closure areas are not expected to exceed the costs and delay of undertaking that process.

Target species

Implicit in the definitions proposed for target species and the rules for monitoring their harvest is the definition of non-target species and the approach to monitoring any shifts in targeting onto other species. There are alternatives to the proposed strategy that include prohibiting taking of non-target species or setting species-specific trigger points on the harvest of non-target species.

A prohibition on taking non-target species would be very likely to lead to discarding problems similar to those encountered in multi-species quota-managed fisheries. There is limited ability to detect small amounts of bycatch in a large catch of target species. It is unlikely that such bycatch could be detected and returned prior to landing and such bycatch would have to be discarded. Accurate records of such discards may be only be available through observer studies, however records of byproduct species that are marketed are far more likely to appear accurately on records.

A trigger catch on each of the byproduct species taken in the Ocean Hauling Fishery is worth considering as an alternate to the collective trigger level proposed in the draft FMS, however, several factors limit the practicality of setting individual trigger levels. One reason for a collective, all inclusive cap is to detect significant fishing effort applied to any species, not just those previously recorded as marketable byproduct. The reported landings of non-target species are very low, but are also highly variable and the trigger levels for such caps would have to account for such variation to prevent needless reviews arising from natural variation in that are irregularly caught species. If there were concern about fishing effort on byproduct species that did occur commonly in catches of some ocean hauling methods, a cap on those species (either by region or for the entire fishery) could be applied and monitored.

iv) Alternatives for improving the veracity of the catch recording system

Stock assessment cannot be reliably conducted without accurate estimates of harvest. The recording of harvest by fishers and the accuracy of those records must be under constant review to ensure the quality and limitations of the records are well understood. The draft FMS proposes

continuing the mandatory reporting of landings by ocean hauling fishers, with a number of initiatives for improving the quality of the reports by fishers.

The fish receivers monitoring program does provide a means of estimating harvest that could provide an alternate to the fishers landings reporting system, however, the fish receivers program would have to undergo significant design changes were it to become the sole source of harvest estimates for commercial fishing. The fish receivers program currently provides an independent estimate of fish production, and requires a record keeping system that provides the means to check the landings estimates provided by fishers.

One of the fundamental changes proposed in the draft FMS is to require beach hauling crews to report daily and collectively, with a single activity report from each crew (hauling team). The present system provides the option of reporting as a team or as individuals and is not viable because of the difficulty in determining the effort applied to catch the fish or whether other fishers have reported the same catch. Landings reports from individuals who report their share of the team catch could be considered but has the disadvantage that the fish is generally sold daily as a single lot, with shares not divided until the fish buyer pays the suppliers for (often) many days catch. The records kept at fish receivers will identify the quantity received from the team of fishers and these records are the best means of validating reported catch. The daily reporting of landings adds significant administrative cost to the catch recording system for the Ocean Hauling Fishery, however alternatives are likely to be more costly. Daily reporting provides a match with the record keeping at the point of first sale and the current monthly reports pool landings over many receivers and make validation of catch reports far more difficult and subject to a significant audit cost.

v) Alternate approaches to management of the bait-for-own-use fishery

Many other commercial and recreational fisheries have an interest in the use of the small pelagic species targeted by the purse seine sector of the Ocean Hauling Fishery as bait. The harvest of bait by State and Commonwealth fishers who target tuna is largely undescribed and uncontrolled and is collectively, with the recreational harvest, likely to be a similar magnitude as the harvest by the purse seine sector. The draft FMS proposes the description and regulation of the bait harvest by all commercial fishers.

There are two different harvest sectors that are proposed to be included in the draft FMS and they present different options for alternative strategies to manage their bait harvest. Elements of the proposed management structure for both groups do not have clear alternatives; the recording of bait harvest and the participation in programs (such as the mandatory code of conduct or observer studies) that are applied elsewhere for similar methods in the Ocean Hauling Fishery.

The responsibility for management of bait collection by Commonwealth tuna fishers could be ceded to the Commonwealth. This would be subject to negotiation under the Offshore Constitutional Settlement. There is no particular reason why this could not occur, providing all parties were satisfied that all ecologically sustainable development requirements were being met. However, sole NSW jurisdiction of coastal bait resources probably makes best sense in that the Ocean Hauling Fishery is the largest known harvester of the resource and recreational fishers, who are managed under NSW laws, are also a very significant user of the same bait resources. Dividing the management of coastal bait resources to provide administrative simplicity for Commonwealth tuna fishers is probably not warranted.

One alternative to issuing permits for bait gathering is to phase the activity out altogether and encourage the supply of bait by the current class C (purse seine) endorsement holders. This may be a viable option and the draft FMS proposes investigating means of holding small quantities of fish by purse seine fishers so that these fish may be sold as live bait.

Those NSW fishers who use lift nets to gather bait are part of the Ocean Trap and Line Fishery and it may be more appropriate to manage that bait gathering activity as part of the Ocean Trap and Line FMS, when it is developed. However, the same arguments about splitting management across jurisdictions applies, to a much lesser extent, with this question. Managing bait gathering with lift nets used by NSW fishers in the Ocean Hauling FMS keeps that activity within the same management framework as all other similar activities.

vi) Alternate approaches to meet information needs in the fishery

Management responses that improve or promote the state of understanding about the Ocean Hauling Fishery include stand-alone activities and components of other programs. Those activities part of other programs, particularly catch monitoring programs are essential and have no alternative independent of considering the entire program. The publication of the results from these other programs is an essential part of the annual reporting system. The publication of the management strategy, environmental assessment and the annual review reports are also essential and have no alternative.

The development of an ongoing education strategy for industry and NSW Fisheries contact officers will provide the opportunity for the Ocean Hauling MAC and NSW Fisheries to determine priorities for educating the community about the Ocean Hauling Fishery.

2. Assessing the Effectiveness of Alternative Management Strategies

As presented in the previous discussions in this chapter, the most significant and high level policy alternative to the suite of input controls is the use of output controls, specifically TACs, and large scale spatial closures. Table D2 below presents the merits of using an output control regime (e.g. TAC) as well as closures against the proposals in the draft FMS, with both considered against a range of sustainability considerations.

The comparison shows that while output controls can be a very effective way of guarding against over-exploitation of quota species, without further controls on gear use or areas fished, they fail to address broader sustainability issues such as reducing bycatch or protecting key habitat. Large scale closures provide very effective protection for key habitat and effective maintenance of ecologically viable stock levels for at least some species (Table D2).

3. Justification of the Preferred High Level Option in the Draft FMS

There are some key species taken in the Ocean Hauling Fishery, such as garfish, yellowtail and blue mackerel, which could lend themselves to quota management more than others. These species, along with most taken in the Ocean Hauling Fishery can be readily targeted, and mostly do not involve significant catches of other species. For garfish, the cross-fishery and cross-jurisdictional issues are

minimal. However, the relatively low value and current low volume of garfish or the other species makes the fishery unlikely to be able to absorb the increased management costs that would be associated with the introduction of a quota system.

A system of large scale closures would also require most, if not all of the existing and proposed management measures to be certain of providing appropriate management outcomes for the Ocean Hauling Fishery.

Given the comparison in Table D2 and the characteristics of the Ocean Hauling Fishery considered under each of the factors discussed above, it is apparent that it is not practicable to implement the suggested alternative management regimes.

With reference to the comparison between input to output controls, this conclusion is consistent with the outcome of a statutory review in 1997/98 that examined the question of whether each NSW commercial restricted fishery should be managed by input controls or output controls. The review was conducted under the *Fisheries Management (General) Amendment (Restricted Fisheries Termination) Regulation 1997* which commenced on 2 May 1997 and was repealed on 26 June 1998.

Table D2. Effectiveness of alternate management regimes in addressing sustainability considerations.

Sustainability consideration	Alternative: output controls	Alternative: closures	Proposed FMS
Maintenance of ecologically viable stock levels	Very effective for nominated species	Effectiveness will vary with species life history	Effective, with some exceptions for certain high risk species
Rebuild stocks to viable levels within nominated timeframes where overfished	Very effective for nominated species	Ineffective without further controls	Effective, with specific proposals for recovery plans for overfished species, fishery restructuring and targeted gear changes
Conservation of biological diversity in the ecosystem and the protected or threatened species, populations or communities and their habitats	Ineffective without further controls	Very effective	Very effective, with proposals for monitoring bycatch and threatened species and changes to fishing in sensitive habitat areas
Protection of the ecosystem in particular key habitat areas	Ineffective without further controls	Very effective, if needed	Very effective, if needed
Fishing operations not being a threatening process to bycatch species	Ineffective without further controls	Ineffective without further controls	Very effective, through proposed changes to gear and monitoring regimes
Responsible stewardship in the management and harvesting of fishing resources, including the accountable management of latent effort and bycatch reduction	Promotes stewardship and addresses latent effort on nominated species, although does not address bycatch reduction without further controls	Ineffective without further controls	Shares should promote stewardship, and FMS effectively addressing effort levels and bycatch issues