Fishery Management Strategy

for the

Ocean Hauling Fishery

February 2003

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The Fishery Management Strategy for the Ocean Hauling Fishery will be updated from time to time. Amendments will be made available on the NSW Fisheries website: www.fisheries.nsw.gov.au.

Cover by J Mathews

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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	Environment 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 2002
RFH	Recreational Fishing Haven
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

Introduction to the Ocean Hauling Fishery FMS

Background

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 a fishery management strategy for each major commercial fishery, the recreational fishery, the charter boat fishery, fish stocking and for the beach safety program. They also require an assessment of the environmental impacts of those fishing activities.

The Ocean Hauling Fishery

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 five 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 1 below shows the relationship between the Ocean Hauling Fishery and other commercial fisheries in NSW.

The Fishery Management Strategy

The fishery management strategy for the Ocean Hauling Fishery contains the rules for the fishery. But it is much more than a collection of rules. The strategy contains the goals and objectives for the fishery, a detailed description of the way the fishery operates, and describes the management framework for the future. It also outlines a program for monitoring the biological, 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 the objectives set out in the strategy are met.

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. As such it is not the role of this management strategy to develop such arrangements.

The management advisory committee (MAC) for the Ocean Hauling Fishery provided significant input into the drafting of the strategy. Input into the draft strategy was also sought from all fishers endorsed in the Ocean Hauling Fishery, the Minister for Fisheries' advisory councils on fisheries conservation, recreational fishing and 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 throughout the drafting of the fishery management strategy.

An environmental impact statement was prepared for the Ocean Hauling Fishery in 2002. The EIS contained the draft fishery management strategy and an environmental assessment on the management rules and risk mitigation measures contained in the strategy. The structure of the EIS was based on guidelines issued by Planning NSW including an assessment of the likely biophysical, social and economic impacts of implementing the draft management strategy.

The EIS was on public exhibition between 1 February 2002 and 18 March 2002. The EIS highlighted the importance of the Ocean Hauling Fishery to the community in terms of employment, supply of seafood to the community and economic benefits. The EIS concluded that the management rules proposed by the fishery management strategy provide for an appropriate allocation of the resource, and incorporate measures needed to address the various principles of ecologically sustainable development.

The Minister for Fisheries made a formal determination under the *Environmental Planning and Assessment Act 1979* in September 2002 with respect to the Ocean Hauling Fishery, which in effect, allows the fishery to continue in accordance with the fishery management strategy. This process relieves ocean hauling fishers of the requirement to undertake individual environmental assessments.

Table 1. Overview of the major marine commercial fisheries in NSW.

(Source: Fletcher & McVea, 2000; Tanner & Liggins, 2000; NSW Fisheries Licensing database – August 2002)

	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 collecting	Demersal trap, Handline, Setline, Dropline	Otter trawl net	Otter trawl net	Trap/pot	Diving (hookah)	Otter trawl net
Species	Sea mullet, Sea garfish, Luderick, Yellowtail, Pilchards	Yellowfin bream, Dusky flathead, Sand whiting, Longfinned eels, Sea mullet, Pipis	Snapper, Kingfish, Morwong, Spanner crabs, Silver trevally	King prawn, School prawn, Royal red prawn, Balmain bugs, Octopus	Silver trevally, Tiger flathead, Redfish	Rock lobster (eastern)	Black lip abalone	School prawn, King prawn
Total catch in 1999/00 (t)	2,767	5,239	1,931	2,473	470***	117	325	625
Est. value in 1999/00 (A$m)	4.8	19,5	10.7	23.4	1.3	4.6	12.7	4.1
No. of authorised fishing businesses in August 2002	333	722	550	318	99	172	44	243
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

* Unlicensed crew permitted only when undertaking boat based prawn seining

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

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

1. Relevant legislation

a) Objects of the Fisheries Management Act

The *Fisheries Management Act 1994* (FM Act) 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.

i) Ecological 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[1]:

- 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

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

- improved valuation, pricing and incentive mechanisms – such as user pays and the use of incentive structures to promote efficiency in achieving environmental goals.

b) 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.

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.

c) 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.

The EPBC Act was 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 EPBC 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) under the EPBC Act. 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.

d) The NSW Marine Parks Act

The NSW Government is using a systematic approach to identify sites for marine protected areas and to prioritise new areas for marine biodiversity conservation in NSW waters. There are three types of marine protected areas in NSW - large multiple-use marine parks, small aquatic reserves and the marine and estuarine components of national parks and nature reserves.

Marine Parks aim to conserve biodiversity by protecting representative samples of the habitats in defined 'bioregions'. Zoning and operational plans are used to guide the protection of conservation values and manage activities that occur within the marine park. Four zones are used in marine parks - sanctuary zones, habitat protection zones, general use zones and special purpose zones.

Consultation occurs with the community prior to the declaration of marine parks. Up to date information on the creation and zoning of marine parks in NSW waters is available on the Marine Park Authority website: www.mpa.nsw.gov.au

The *Marine Parks Act 1997* was introduced to provide for the declaration of marine parks in NSW. 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.

This fishery management strategy has been prepared taking into account, and ensuring consistency with, the objects of the *Marine Parks Act 1997*.

e) Share management plans

i) The role of a 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 for the Ocean Hauling Fishery will be prepared as part of the transition of the fishery to a full share management regime.

The primary role of a share management plan is to provide a legislative structure for the class or classes of shares and the rights of shareholders in a share management fishery. The share management plan also makes provision for a range of fishery specific controls to be formalised into a regulation. Examples of these include the fish that may be taken, the areas for taking fish,

the times or periods during which the fishery may operate, the protection of fish habitats, as well as the use of boats, fishing gear and bait in the fishery.

The share management plan for the Ocean Hauling Fishery may also bring into operation a number of controls in the fishery that are described in this management strategy. One example of this is the share forfeiture scheme referred to in the management strategy. Whilst the management strategy relies on the share forfeiture scheme as a compliance mechanism for creating an effective deterrent, the workings and provisions of the scheme will be included in the share management plan for the fishery.

A share management plan must include objectives and performance indicators which, for the Ocean Hauling Fishery, will be consistent with the goals and objectives of this management strategy. The share management plan must also specify at what point a review of the plan is required when a performance indicator is not being met. The review process to be included in the share management plan will complement the review process outlined in this management strategy. This will ensure that there is a robust review and reporting framework for the fishery that is underpinned by the provisions of the share management plan.

In addition to a review that may occur if a trigger point is breached, a share management plan for a category 2 share management fishery must also be subject to scheduled periodic review. With regard to the Ocean Hauling Fishery, shares are to be issued for an initial term of 15 years and a review of the management plan is to be conducted between years five and ten of that period.

ii) Transition to 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. The progression to a share management regime is a staged implementation.

The fishery is first identified as a share management fishery by being included in Schedule 1 of the 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 regulations that applied to the restricted fishery.

Applications for appeals against the allocation of shares are lodged before the fishery is formally commenced. The MAC for the fishery and any other relevant commercial or recreational industry groups will be consulted on the proposed management plan. The management plan for the fishery is then put into regulation, final shares are issued and the fishery then commences as a full share management fishery.

iii) Changes to Regulations

In the most part, the current regulations that apply to the Ocean Hauling Fishery appear in the *Fisheries Management (General) Regulation 2002* ('the Regulation'). The Regulation

sets out the working arrangements that underpin the provisions of the *Fisheries Management Act 1994*, and are made pursuant to that Act. For example, an offence appears in the Act for possessing prohibited size fish (section 16), however it is the Regulation that prescribes the fish species subject to size limits and what those size limits are (clause 7).

This management strategy includes a number of actions that will impact on the current regulations that apply to the fishery. Examples of these includes the incorporation of maximum dimensions of the various net types permitted in the fishery and potential alterations to give effect to the garfish recovery program once developed. Where it is necessary to introduce or change controls prior to the development and implementation of a share management plan for the fishery, changes to the Regulation will be made.

If a management plan for a fishery is inconsistent with any other regulation or fishing closure, the management plan prevails. Therefore, a share management plan is an appropriate tool that can be used to implement controls that are specific to the Ocean Hauling Fishery. The only occasion where a management plan does not prevail over another regulation is if a regulation specifically expresses that it is to have effect despite a management plan. An example of when this may occur is where a short-term closure may be introduced in response to an emergency.

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, high value exports, and carries out fishing in an ecologically sustainable manner.

b) Fishery goals

The goals that have been selected 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 ecologically 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 Ocean Hauling 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. Fishery description

a) An overview

i) Extent of the fishery

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.

ii) Number of operators

In August 2002, NSW Fisheries licensing database showed 333 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.

iii) Activities endorsed in the fishery

The fishery is categorised into a number of endorsement types that determine the types of fishing gear each fisher is allowed to use. Table 2 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 for the fishery appears in section 4(ii).

Table 2. 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

iv) Overall catch levels and value

The Ocean Hauling Fishery is currently fished at a level which 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.

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 of the Ocean Hauling EIS for an explanation of the basis of these value figures). In this management strategy, no attempt has been made to correct prices for the many, known factors that will make Sydney Fish Market (SFM) prices inaccurate.

Definition of regions and reporting zones

The seven ocean hauling regions are identified in Map 1 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 3 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 3 as these endorsement holders may travel across the regional boundaries. Although 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 1), consistent with all other ocean fisheries in NSW. Table 4 outlines the variation in the landings of seven target species taken by <u>all</u> ocean hauling methods along the NSW ocean zones as defined in Map 1.

Table 3. 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 more patchy 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 4. 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.

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 5). 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 5). The two main methods, general purpose hauling and purse seining, together take about 90% of the catch of the fishery.

Table 5. 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

Catch and landings of the prominent species in the fishery

Appendix 3 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.

b) 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 2002*)

(b) the waters of Jervis Bay

(c) 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

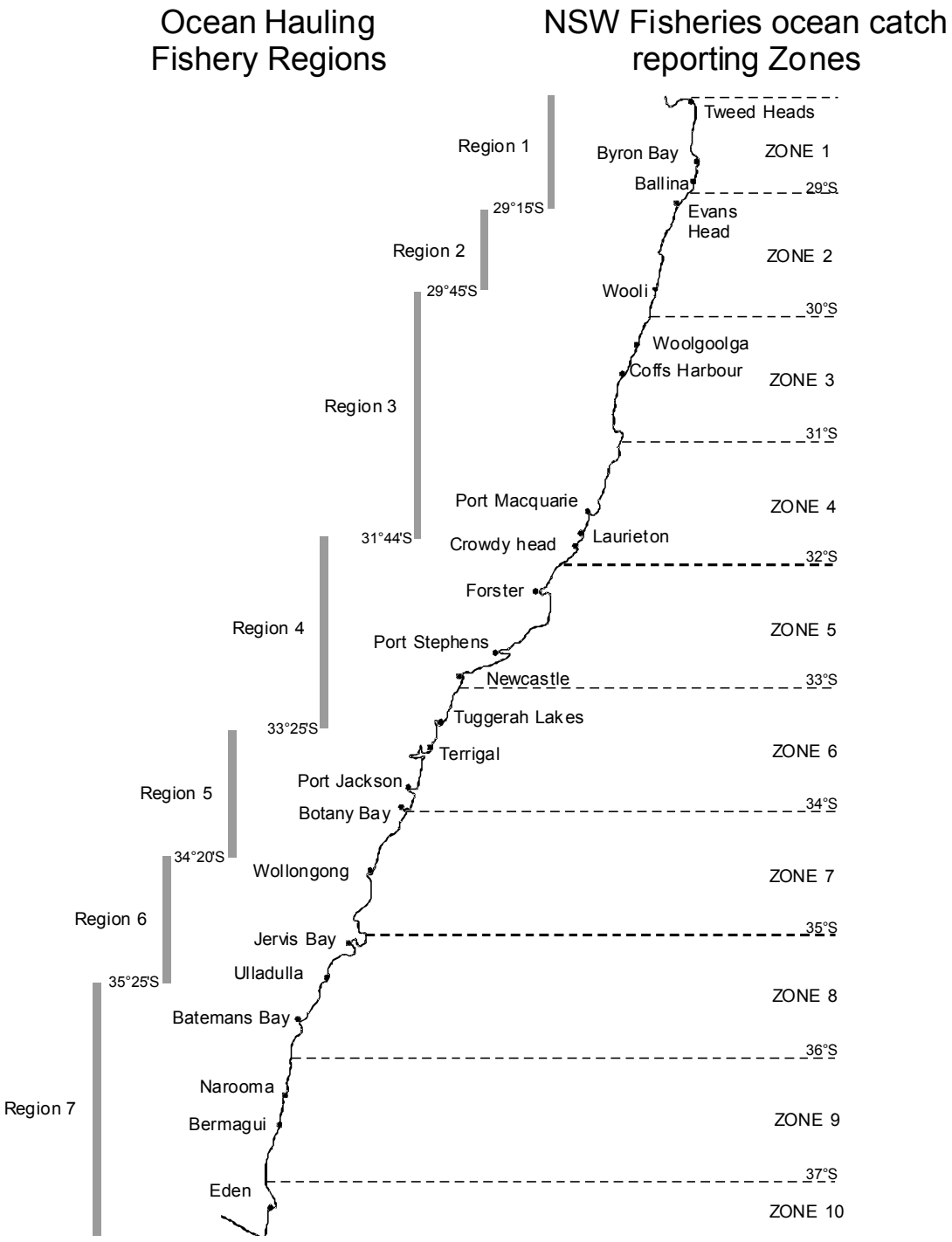
(b) a line drawn from the eastern most extremity of the one breakwall to the northern or southern extremity of the high water mark on the opposite bank

(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 2 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 4(x) 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 management strategy includes the use of time and area closures to restrict the access of commercial fishers when and where necessary (refer to management response 4.5a). 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.

As part of the implementation of this management strategy (see management response 4.5a), a number of new ocean beach areas have been formally closed to ocean hauling. A list of the areas of ocean beach closed through implementing the outcomes of the regional liaison process is included in Appendix 2.

It is important to note that class A (skipper) endorsement holders and class B (crew) endorsement holders, are restricted to operating within one of seven regions along the NSW coast. The seven ocean hauling regions are identified in Map 1 and vary in size considerably. The class C (purse seine) endorsement holders are not restricted to purse seining in any one region.



Map 1. Regions in the Ocean Hauling Fishery and ocean zones for reporting of commercial landings taken in NSW coastal waters.

c) 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 1 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 also been included in Appendix 1.

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. A list of conditional target species has been identified in Appendix 1 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.

Byproduct 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 6 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 6 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

Table 6. 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 - *Mugil cephalus*	Fully Fished	Target	No take	Not take	No take
Blue mackerel - *Scomber australasicus*	Moderately to Fully Fished	Target		Target	Target
Yellowtail - *Trachurus novaezelandiae*	Fully Fished			Target	Target
Yellowfin bream - *Acanthopagrus australis*	Fully Fished	Target	No take	No take	No take
Sea garfish - *Hyporhamphus australis*	Overfished		Target	No take	No take
Sand whiting - *Sillago ciliata*	Moderately Fished	Target	No take	No take	No take
Pilchards - *Sardinops neopilchardus*	Unknown			Target	Target
Australian salmon - *Arripus trutta*	Unknown	Target			Target
Luderick - *Girella tricuspidata*	Moderately Fished	Target	No take	No take	No take
Dart - *Trachinotus spp.*	Unknown	Target			
Sandy sprat (whitebait and glass fish) - *Hyperlophus vittatus*	Unknown			Target	Target
Jack mackerel - *Trachurus declivis*	Unknown				Target
Anchovy - *Engraulis australis*	Unknown			Target	Target
Bonito - Family: Scombridae	Unknown	Conditional Target			Target
Silver trevally - *Psuedocaranx dentex*	Fully to Overfished	Conditional Target			Target
Sweep - *Scorpis lineolatis*	Unknown	Conditional Target			Target
Leadenall - *Auxis thazard*	Unknown	Conditional Target			
Mackerel tuna - *Euthynnus affinis*	Unknown	Conditional Target			No take
Northern bluefin tuna - *Thunnus thynnus*	Unknown	Conditional Target			No take
Tarwhine - *Rhabdosargus sarba*	Unknown	Conditional Target	No take	No take	No take
Diamond fish - *Monodactylus argenteus*	Unknown	Conditional Target			
Yellowfin tuna - *Thunnus albacares*	Unknown	Conditional Target			No take
Mulloway - *Argyrosomus japonicus*	Unknown	Conditional Target	No take	No take	No take
Spanish mackerel - *Scomberomorus commerson*	Unknown	Conditional Target			
Big eye tuna - *Thunnus obesus*	Unknown	Conditional Target			No take

A summary of the most prominent species taken in the Ocean Hauling Fishery is presented in Appendix 3. 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.

Many species taken in the Ocean Hauling Fishery are also taken in other NSW commercial fisheries, by other sector groups and by fisheries managed under the jurisdiction of the Commonwealth or other States. The FM Act establishes a system of advisory councils who provide advice to the Minister for Fisheries on cross-fishery management issues. NSW Fisheries management and research staff will meet biannually with adjacent jurisdictions to consider consistent management regimes for shared species and to discuss initiatives such as stock assessment, complimentary size limits, monitoring programs and recovery programs for overfished species. Cross jurisdictional collaboration has occurred often on an as-needed basis in the past, however, a more formalised approach to joint management will now be undertaken.

Provided below is a table showing the relative catch levels of target species landed in the Ocean Hauling Fishery and in adjacent jurisdictions.

Table 7. Landings of target species in adjacent jurisdictions.

Ocean Hauling Target Species	NSW 1998/9	Victoria 1997/8	Queensland 1996	Commonwealth
Anchovy	2	326		
Australian salmon	160	708		
Black Bream		155		
Blue Mackerel	356			JMF, SENTF, Bait
Bonito	263			
Dart	9		29	
E. Sea Garfish	78	91		
Jack Mackerel	15	6		JMF, SENTF, Bait
Luderick	470	51		
Pilchard	194	791	52	JMF, SENTF, Bait
Sand Whiting	165			
Sandy Sprat	39			
Sea Mullet	2905	14	1704	
Sweep	81			
Yellowfin Bream	343		138	
Yellowtail	442			JMF, SENTF, Bait

ii) Bycatch species

Bycatch consists of those animals that are discarded from the catch or retained for scientific purposes, and that part of the "catch" that is not landed but is killed as a result of interaction with fishing gear. Fish that are landed are sometimes discarded because there is no market for that type (or size) of fish, or because the regulations prevent the fish from being retained (e.g. if it is smaller than the minimum legal length or is a species protected from commercial fishing).

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 provided for in management responses 1.1a-c in section 8.

iii) Size limits

Size limits apply to a number of key species taken in the Ocean Hauling Fishery. Table 8 lists the minimum legal lengths that apply to species permitted to be taken in the fishery.

Table 8. 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

* byproduct only

** increased from 33 cm on 1 July 2001

*** increased from 28 cm on 1 July 2001

iv) Protected fish

The *Fisheries Management (General) Regulation 2002* identifies a number of species that are protected, either from commercial fishing or fishing by all sectors. Table 9 contains these lists of species as at March 2002.

Commercial fishers are not permitted to take either protected fish or fish protected from commercial fishing (table 10).

Table 9. Fish species protected from fishing by all sectors.

Protected fish include:	
Common name	**Scientific name**
Ballina angelfish	*Chaetodontoplus ballinae*
Eastern blue devil fish	*Paraplesiops bleekeri*
Elegant wrasse	*Anampses eleganus*
Estuary cod	*Epinephelus coioides*
Giant Queensland groper	*Epinephelus lanceolatus*
Grey nurse shark	*Carcharius taurus*
Great white shark	*Carcharodon carcharias*
Herbst nurse shark	*Odontaspis ferox*
Black rock cod	*Epinephelus daemelii*
Weedy sea dragon	*Phyllopteryx taeniolatus*
Australian grayling	*Prototroctes maraena*
Eastern freshwater cod	*Maccullochella ikei*
Trout cod	*Maccullochella macquariensis*
Macquarie perch	*Macquaria australasica*

Table 10. Fish protected from commercial fishing only.

Fish protected from commercial fishing include:	
Common name	**Scientific name**
Black marlin	*Makaira indica*
Blue marlin	*Makaira nigricans*
Striped marlin	*Tetrapturus audax*
Blue groper	*Achoerodus viridis*
Atlantic salmon	*Salmo salar*
Australian bass	*Macquaria novemaculeata*
Eel-tailed catfish	*Tandanus tandanus*
Estuary perch	*Macquaria colonorum*
Silver perch	*Bidyanus bidyanus*
Brook trout	*Salvelinus fontinalis*
Brown trout	*Salmo trutta*
Rainbow trout	*Oncorhynchus mykiss*
Freshwater crayfish	*Euastacus* spp., *Cherax* spp. (except *Cherax destructor*)

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.

A range of threatened species, other than fish, are protected by other legislation including the NSW *Threatened Species Conservation Act 1995*, the NSW *National Parks and Wildlife Act 1974*, and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

v) 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 management strategy includes 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 1.1a). Secondly, a modification to the monthly mandatory catch return forms will incorporate reporting fishers' interactions with threatened species (see management response 3.1a).

A number of management responses also appear in section 8, which are aimed at minimising impacts on threatened species. These measures include using fishing closures (management response 4.5a), modifying gear use (management response 1.1b) and implementing the provisions of any threatened species recovery plans or threat abatement plans (management response 3.1b).

vi) 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. To allow a species based management approach where all known impacts on species are considered, where there are data, recreational harvest, charter boat harvest and landings from other sectors are also taken into consideration when determining a status. This reporting method uses the terms defined in Table 11 to describe the stock status:

Table 11. 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

vii) Overfished species

When a species taken in this fishery is determined as 'overfished', this management strategy requires the implementation of, or assistance in developing, a recovery program for that species (see objective 2.5 and related management responses in section 8 of this management strategy). 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 9 of this management strategy). 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 6 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 11 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.

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 management strategy requires the development of a 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 2.5e).

Appendix 3 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 3 includes a summary of silver trevally, including general information on the biology of the species, habitats, catch and market information.

Specific actions in the management strategy to address overfishing

Objective 2.5 in section 8 of this management strategy 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.

d) Gear used in the fishery

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 in the fishery, the use of a lift net by licensed commercial fishers to take bait for tuna operations will also be managed under the auspices of the Ocean Hauling Fishery.

The following sections describe the fishing gear used in the fishery and give details relating to the standard dimensions of that gear. Appendix 1 identifies more specific gear dimensions that apply in the fishery 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 2.1c includes a restriction on the gear dimensions of nets used in the fishery to those defined in Appendix 1.

This management strategy includes a restriction on 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 1.3a). Under the management strategy, a ‘priority of shot’ rule applies to teams hauling to and from sea beaches.

i) Fish hauling nets

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 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. Details of the target species, conditional target species and byproduct rule for the general purpose net are contained in Appendix 1.

This management strategy amends 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 included within Appendix 1.

Pilchard anchovy and bait net

The management strategy provides for the lawful use of 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 amendments to the definition and use of the pilchard, anchovy and bait net are contained within Appendix 1.

This net type is predominantly used to catch pilchards, yellowtail, blue mackerel and whitebait. Details of the target species, conditional target species and byproduct rule are contained in Appendix 1.

Garfish hauling net

A garfish hauling net is a net specifically designed to catch garfish. This management strategy includes an action to drop the concession to use garfish hauling nets with 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 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 to be the single target species for this method. Details of the byproduct rule and all additional amendments to the definition and use of the garfish hauling net are contained within Appendix 1.

ii) Other methods

Garfish bullringing net

The garfish bullringing net is historically a method used in estuary waters to target garfish, and this will be removed from use in ocean waters (under management response 2.5e in section 8 of this management strategy).

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. This management strategy applies 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 for a purse seine net used in ocean waters (with the exception of Twofold Bay) is 1000 m. 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 target species, byproduct rule and all additional amendments to the definition and use of the purse seine net are contained within Appendix 1.

Lift net

A lift net is used only for collection of pilchards, blue mackerel and yellowtail as bait for taking tuna. The lift net consists of netting which can be suspended from a rigid frame and is submerged below the vessel operating the net. Burley or fish attraction devices are then used to aggregate fish above the net, before the net is lifted collecting fish for bait.

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, are 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 1. The management of the harvest of bait using this method is described in management responses 2.2e and 2.2f in section 8.

iii) Boats used in the fishery

Although previously dominated by beach based fishers, technological advances in operations has seen an increase in boat based operations in the fishery.

The boats used in the beach haul 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 are often also used in the estuary general fishery, while some of the more powerful vessels are sometimes used in the ocean trap and line fishery, by those fishers who also hold endorsements in either 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

motor. Total number of fishing boats, and the relative age of the boats, currently used in the ocean hauling fishery is unknown. As many fishers are beach based, commercial catch records in recent years have not provided for the recording of vessels.

The boats used in the boat based or purse seine sectors of the fishery are often a larger version of the typical runabout 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 fishery.

e) Interactions with other fisheries

The Ocean Hauling Fishery interacts with a number of other designated fishing activities. These activities include other commercial fisheries, recreational fishing, charter boat fishing, the beach safety program and the stocking of fish into NSW waters. This section discusses on the interaction between these activities and the Ocean Hauling Fishery.

Interactions with 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. Approximately 90% of ocean hauling fishers hold entitlements in other fisheries. Ocean hauling fishers most commonly have entitlements to fish in the Estuary General Fishery and the Ocean Trap and Line Fishery.

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 or two other fisheries.

Of the fishers who participated in the Ocean Hauling Fishery, approximately:

14% participated in the Ocean Hauling Fishery only

48% participated in 2 fisheries

34% participated in 3 fisheries

3% participated in 4 or more fisheries

Participation generally mirrors entitlements and is most common in the Estuary General Fishery and next most common in the Ocean Trap and Line Fishery.

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

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

Interactions with 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 7.

Offshore Constitutional Settlement (OCS)

The Offshore Constitutional Settlements (OCS) involves 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 still binding and covers waters outside 3 nautical miles (nm). The Commonwealth retain jurisdiction over tuna and billfish species by the main commercial methods in all offshore waters (outside 3nm) and over the 16 major trawl species (see attachment) by the methods of fish trawling south of Barrenjoey Point only. The Commonwealth Small Pelagics Fishery also extends outward from 3 nm.

Under the agreement, NSW retains jurisdiction for all species in all coastal waters (inside 3nm). North of Barrenjoey Point, the Commonwealth has ceded jurisdiction for all species from 3 nm to about 80 nm (except tuna and tuna like species and the Small Pelagics Fishery). South of Barrenjoey Point, NSW has jurisdiction for trawling inside 3 nm only, however NSW still retains jurisdiction outside 3 nm to abut 80 nm for all other species, except tuna and tuna like species and the Small Pelagics Fishery.

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.

Some jurisdictions allow Commonwealth endorsed fishers to harvest bait within the relevant state waters based on their Commonwealth endorsement alone. Commonwealth operators wishing to harvest bait from NSW waters require a permit or the relevant NSW endorsement. Further discussions with the Commonwealth may occur with respect to this arrangement. In addition, discussions are also occurring with the Commonwealth regarding permit holders being required to complete a catch record relating to bait harvested in accordance with purse seine permits.

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 Pelagics Fishery

The Commonwealth Small Pelagics Fishery 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 Small Pelagics Fishery and particularly the impact of this fishery on the NSW ocean hauling fishery.

Small pelagic species currently under Commonwealth jurisdiction in the Small Pelagics Fishery include jack mackerel (*Trachurus declivis*), Peruvian jack mackerel (*T. murphyi*), yellowtail (*T. novaezelandiae*), blue mackerel (*Scomber australasicus*) and redbait (*Emmelichthys nitidus*). Catches in the Small Pelagics Fishery are not identified by species and the most recent reported catch from the entire Small Pelagics Fishery was 3790 tonnes (www.afma.gov.au /fisheries/small%20pelagic/default.htm).

The Commonwealth Gillnet, Hook and Trap Fishery (GHTF)

There is very little overlap between most of the GHTF and the NSW Ocean Hauling Fishery. However, there are a number of purse seine endorsements in that fishery that have access to the same species as the Small Pelagics Fishery adjacent to NSW waters.

Interactions with the recreational fishery

To obtain reliable estimates of non-commercial fishing patterns and levels of harvest, a National Recreational and Indigenous Fishing Survey was completed in 2002. Data from the survey shows a reasonable interaction between recreational fishing and the Ocean Hauling Fishery, as some of the target species within the fishery are also targeted by recreational anglers. This includes yellowfin bream, sand whiting, Australian salmon, luderick and to a lesser degree yellowtail which is often used as bait by recreational anglers. Figures from the National Recreational and Indigenous Fishing Survey indicates that approximately 17.1% of the NSW population (approximately 1 million people) participate in recreational fishing.

Interaction with the beach safety (shark meshing) program

There is negligible interaction between the Ocean Hauling Fishery and the beach safety program which occurs in ocean waters.

Interaction with fish stocking

There is minimal interaction between the Ocean Hauling Fishery and fish stocking as stocking programs predominantly take place in freshwater areas including lakes and impoundments.

4) Management Controls and Administration

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 2 and in the *Fisheries Management (General) Regulation 2002*.

i) 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 1(e) outlines the process of moving from a restricted fishery regime to a share management regime.

ii) Licensing Arrangements

Commercial 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 any 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.

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 a nominated fisher of an RFO, or individuals who are the holder of shares in a share management fishery. This latter provision will become the more relevant requirement as the Ocean Hauling Fishery moves toward full implementation of category 2 share management.

This management strategy retains the RFO concept under category 2 share management, and will use shares to allow for structural adjustment at the fishing business level improve the economic viability of fishers. The provisions in the management strategy will supersede the relevant provisions of the Licensing Policy as they are implemented.

Table 12. Number of commercial fishers endorsed in each sector of the Ocean Hauling Fishery.

(Source: NSW Fisheries 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.

In addition to the 26 Class C purse seine endorsement holders as shown in table 12 above, there were an additional 37 Class C permit holders at September 2002.

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. Separate minimum shareholdings may apply to each endorsement or each region in the fishery, or to both.

Section 8 of this management strategy includes a number of principles that will be adopted with respect to setting minimum shareholdings in the management plan (see management response 2.2d). 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 used to achieve any required short-term changes in fishing effort or practices.

Fishing boat licensing

In addition to each fisher requiring a commercial fishing licence and most fishing nets having to be registered, 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 the management strategy.

To prevent any increase in size and therefore efficiency of vessels in the fishery, a strict boat replacement policy exists and will continue under the management strategy. A previous restriction of 5.8 m applied to boats used in the Ocean Hauling Fishery. Following a recommendation by the Estuary General Fishery MAC and the Advisory Council on Commercial Fishing, boats 5.8 m in length or less may be replaced with boats up to 6 m. Boats that are greater than 6 m in length may only be replaced with boats that are no more than 10% or 1 m 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.

In addition, the Minister for Fisheries has approved a new provision allowing fishers to temporarily replace their fishing boats with smaller boats for up to two years. During this time, a permanent boat replacement must be made with respect to the original boat.

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 management strategy will continue the restrictions on the use of unlicensed crew, however the implementation of minimum shareholdings to operate a hauling team provided for in management response 2.2d has the capacity to change arrangements for unlicensed crew.

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.

The arrangements are transitional in nature and lapse when a fishing business is sold. Consideration as to the continuance or otherwise of these special arrangements will be considered during the development of the share management plan.

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, 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 management strategy requires the development of a management system for bait gathering using purse seine and lift nets (see management responses 2.2e and 2.2f). 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.

iii) Renewal of licences

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.

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.

iv) Appeal 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/

v) 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 2002* 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.

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.

vi) 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 2002* which provides for trainer and trainee fishing licences.

"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 or relevant number of shares specified in the share management plan 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.

vii) 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 management strategy.

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 will continue under the management strategy (refer to management response 2.2h).

viii) 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 amendments is provided in Appendix 2 (see management response 2.1c). Appendix 2 also stipulates in many cases how the gear must be operated. This management strategy will 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 2.2h). The current regulations relevant to the Ocean Hauling Fishery will continue, subject to any changes necessary to implement this management strategy.

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 2.2c in section 8 of this management strategy aims to improve management controls for the engine size on licensed fishing boats in the beach fishery.

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.

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 4.5b in section 8 of this management strategy). The management strategy includes the development of a code of conduct, enforceable by conditions on licences, for the purse seine sector of the Ocean Hauling Fishery (see management response 4.5c).

ix) Transfer policies

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. Any transfer of a fishing boat licence must first be approved by the Director, NSW Fisheries.

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. An outline of the current transfer policy is contained within section 5(b)(vii) of Chapter B of the Ocean Hauling EIS.

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.

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 management strategy.

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 area/region
- 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 3 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 8 of this management strategy (refer to management response 4.5a).

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.

Zoning

The intention of the zoning scheme in 1995 has limited fishers' operations to one of seven regions along the NSW coastline (See Map 1). At that time, 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 management strategy, with the incorporation of all boat-based garfish haulers into the scheme (see management response 2.5f in section 8 of this management strategy). Class C endorsement holders will not be restricted to individual zones under the management strategy.

Other 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 2002*)
- 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 conflict within the commercial fishing industry in these regions at the time. The management strategy provides for the implementation of the agreements made in 1995 and the initiation of the process for regions 5 and 6.

Recognised fishing grounds

Section 39 of the *Fisheries Management Act 1994* and clause 105 of the *Fisheries Management (General) Regulation 2002* provide for the declaration of waters used for net fishing by commercial fishers as recognised fishing grounds (RFGs). The management strategy provides for the development of 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 4.5d).

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 RFGs. 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 RFGs 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 RFGs 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 for Fisheries. 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 management strategy is finalised, it will be up to the Ocean Hauling MAC to decide on the extent and scope of any implementation program for RFGs in their fishery. The implementation program will need to be financed by an industry contribution determined on advice from the MAC.

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.

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 management strategy (see management response 6.4b in section 8).

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) Catch limits or quotas

Section 9 of this management strategy 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.

In addition to those limits, a daily bycatch limit applies to Australian salmon taken north of Barrenjoey Headland to the Queensland border, and tailor taken in all NSW waters taken by commercial fishing nets as follows:

Table 13. Catch limits that apply to species taken in the Ocean Hauling Fishery.

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 management strategy (see management response 4.1b), in addition to the 20% shot-by-shot restriction that will apply on the capture of byproduct species (see management response 1.3a). Other species based catch controls such as size limits and protected fish are discussed in section 3(c) (iii-iv) of this management strategy.

xiii) 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 management strategy (see management response 5.4a).

xiv) 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 FM 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 management strategy or as a result of the environmental assessment process will need to be fully funded by the fishery participants.

A range of regulatory and administrative fees are payable by fishing business owners in the Ocean Hauling Fishery. The management strategy does not, in itself, set the charges, or limit or otherwise govern the way fees are charged.

5. 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 6.1a in section 8 of this management strategy).

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 and fishing gear in the Ocean Hauling Fishery. The quality inspection guidelines will ensure that all issues requiring compliance by commercial fishers under this management strategy are subject to a compliance program, including the enforcement of byproduct rules that apply to the fishery.

A penalty points system

A penalty points scheme linked to endorsement suspension and share forfeiture provisions will be introduced under the management strategy and developed as part of a share management plan for the Ocean Hauling Fishery (see management response 6.1b in section 4).

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 operate beyond the rules. This minority continue to breach the rules applying to the fishery possibly and the courts sometimes appear unwilling to impose significant fines (which may be viewed as minor when compared to other criminal offences). The penalty points system is a way of providing a clear deterrent to fishers who are considering breaching the provisions of the management strategy or associated rules, as well as providing the courts with a regulated management plan that reflects the serious nature of some fisheries offences.

Similar to the motor vehicle licence demerit points scheme works (administered by the Roads and Traffic Authority), the system would provide for a list of penalty points assigned to serious or repeated offences. If a fisher accrued a certain level of penalty points by breaching the rules applying to the fishery, the endorsement or fishing right 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.

6. Research

a) Proposed research areas

Stock assessment of key species

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).

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 8.2d). It is intended that the performance of logbooks will be tested in a pilot study in 2003 and, if appropriate, be fully implemented across the fishery soon after. In conjunction with the logbook, a daily 'spotting' diary is also included (see management response 8.2e). This will 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 and silver sweep. Estimates of the age composition of yellowtail 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 included 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 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).

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 Fishery and Ocean Trap and Line Fishery.

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.

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.

The management strategy provides for the establishment of an observer-based study to assess bycatch and discarding in the Ocean Hauling Fishery (see management response 1.1a). 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.

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.

An independent observer-based study will 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 1.1a, 8.1d and 8.1e). 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. The management strategy involves 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.

b) The Conservation Technology Unit

In March 2001 NSW Fisheries established a Conservation Technology Unit to examine conservation-based gear technology in commercial and recreational fisheries. This focussed research initiative will help address gaps in knowledge including the selectivity of fishing gear used in the Estuary General Fishery. The research will also assist in identifying the most appropriate gear to be used in the fishery and ensure that future changes to gear regulations can be based on accurate scientific information. The development of new and innovative fishing techniques will help minimise unwanted catches, discarding and environmental change.c)

c) 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 management strategy, 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 8.2a). 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. Through the implementation of this management strategy, fishers will also use daily records based on teams during the mullet travelling season, which occurs between March to July. These daily records will provide a more accurate record of the total quantity of fish landed in the fishery, and reduce the possibility of the same catch being reported by a number of fishers within a hauling crew. These daily records will still, however, be submitted on a monthly basis. In addition to the daily recording of hauling crews, a facility will also be included so that crews can report on schools of fish that are observed travelling along the coast but where no shot was made by that crew to catch those fish. Further details regarding this recording system can be found in management response 8.2d and the background to that response. This information is to be 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 included in section 8 of this management strategy 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 scientific monitoring program.

The entry of catch return information onto the database is subject to stringent quality control procedures including a three month timeframe for data entry following the receipt of a catch return by NSW Fisheries. A policy is being developed to manage the timely receipt and entry of commercial catch return data into the commercial catch records database.

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) Fishers who have not submitted catch returns in a timely fashion are being notified and requested to submit omitted returns and an ongoing procedure for dealing with missing returns is being developed.

(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.

All existing and proposed procedures attempt to maximise data quality. 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 data. 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".

7. Consultation

There are a range of consultative bodies established in NSW to assist and advise the Minister for NSW 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.

a) The Management Advisory Committee

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 13 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 management strategy to consultation with the Ocean Hauling MAC. Consultation involves seeking the advice of the MAC on its 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. For this reason, references to consultation with the Ocean Hauling MAC in this management strategy may include the distribution of documents to 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.

Table 14. 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	

b) 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.

c) Fisheries Resources 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 RFH selection processes
- reviewing community consultation reports that arise from the RFH selection process.

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

The composition and role of the FRCAC is set out by the FM Act and its regulations and decisions made by the Minister for Fisheries. These arrangements may change from time to time.

d) Total Allowable Catch Setting and Review Committee

A Total Allowable Catch Setting and Review Committee is established under the FM Act, however, currently does not consider matters directly relevant to the operation of the Ocean Hauling Fishery.

8. Goals, Objectives and Management Responses

a) A model framework

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

Figure 1. 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 1. 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 2).

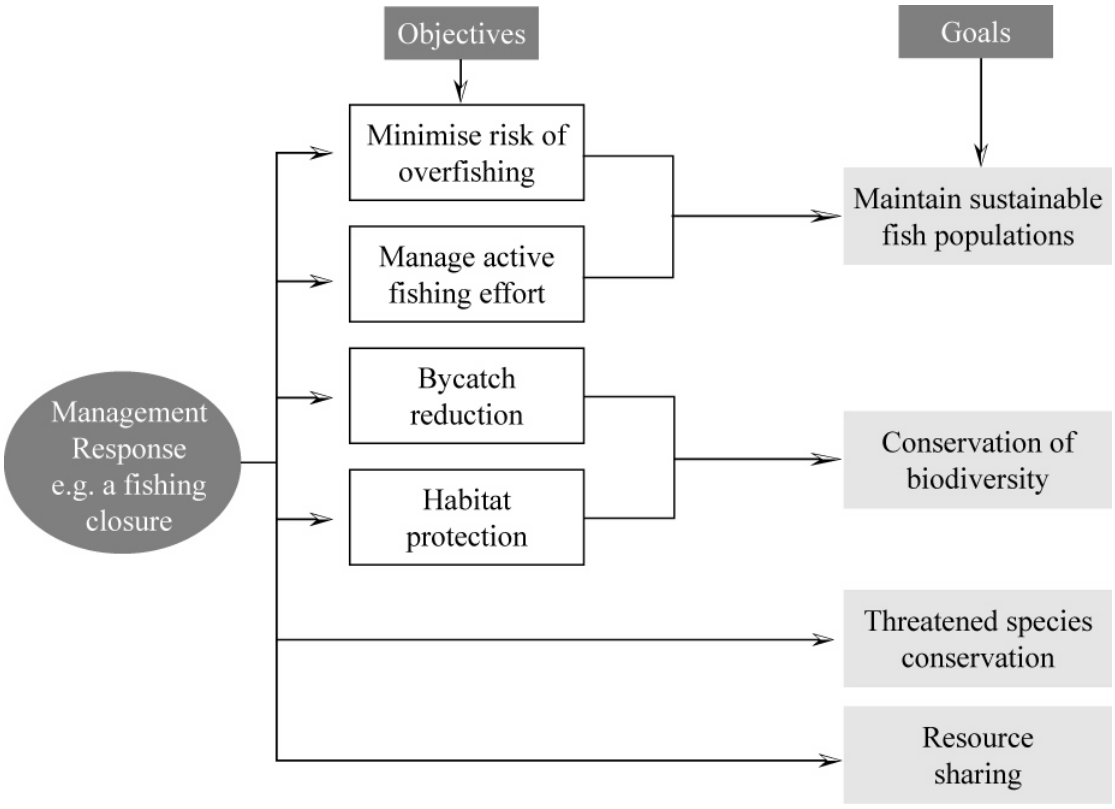


Figure 2. Example of how a single management response affects multiple goals and objectives.

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 timeframes 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

The impact of the fishery on non-target species and the environment 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 also not been formally described but are anecdotally thought to be low.

Much of the fishing in the fishery takes place in either open water or on beaches where impacts of fishing on habitats have not been described but are also thought to be low.

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:

i. document rate and species composition of bycatch for each gear type in the fishery

ii. 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).

iii. document the interaction with ocean hauling fishing methods on fish habitats and on threatened 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 will 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. Having regard to the range of areas on which the study may

focus, the observer program will include a pilot study to determine the best use of available resources. Another outcome of the observer program will be the collection of data on spatial overlaps of interactions (if any) between the Ocean Hauling Fishery and threatened species. Further information on the scientific observer program is presented in Section 6 of this management strategy.

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 management strategy 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 will be no need to keep the program ongoing and repeat estimates will only be needed periodically or when a change in gear or practice necessitated new information.

The observer program will be designed and costed in full consultation with the Ocean Hauling MAC. The MAC may present alternative schemes and investigate competitive service delivery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,3,4,7,8	From 2003	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 intention of this management response is to reduce the impact of the fishery on bycatch. Management response 1.2b is a related response which aims to reduce the impact of the fishery on aspects of the marine and terrestrial environment (over and above bycatch). 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. The independent observations of fishing practices generated by the observer studies will provide information to assist this process. The observer program will be repeated to assess new or modified practices, (or otherwise be repeated periodically) so as to ensure that best available knowledge and available technology is used within the fishery. 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
1,2,4	Current & 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: Whilst there are no immediate controls to be introduced through the implementation of this management strategy, new techniques for handling incidentally caught organisms are often developed. Such techniques are often developed as an initiative of industry, or through research and development projects.

Options for handling techniques could include using techniques for sorting fish while still in the net by using escape grids, transparent panels or sorting pens, as appropriate. The independent observations of fishing practices generated by the observer studies will provide important information to assist this process. If the observer programs detect that handling techniques are not effective or could be improved, the management strategy allows for immediate review or modification of handling practices.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,4	Current & 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 2002* including controls on the dimensions, construction materials and modes of operation (unless otherwise described by this management strategy).

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4	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
1,2,4	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
1,2,6,7	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: The intention of this management response is specifically to reduce the impact of the fishery on aspects of the marine a terrestrial environment (other than bycatch). Management response 1.1b is a related response which aims to reduce the impact of the fishery on bycatch. 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. Such modifications are provided for under this response and under management response 1.1b 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
1,2,6,7	Ongoing	NSW Fisheries OH MAC OH 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) 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 Estuary General FMS, the prohibition on the general purpose hauling on* Posidonia *is extended to the Ocean Hauling Fishery. This prohibition is a provision of the Fisheries Management (General) Regulation 2002.*

Contributing to Goals	Timeframe	Responsibility	Authority
1,4	For point ii) by July 2004	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 integrity (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 1 for each of the ocean hauling methods and include provisions for the landing of byproduct.

Background: The Fisheries Management (General) Regulation 2002 *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 1 includes 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, including the byproduct catch level rules for the fishery. Landing in excess of the relevant byproduct limit for any species in the fishery may result in a breach of the regulatory provisions applying to the gear type being used. In broad terms, each method in the fishery is restricted to a total catch of non-target species not to exceed 5% of annual 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.*

Consultation will occur with the MAC in the future regarding restricting the range of byproduct species that may be taken in the fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4	July 2003	NSW Fisheries OH Fishers	Regulatory

(b) Collaborate with other institutions (such as universities and other research facilities) 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. NSW Fisheries collaborates with universities and other institutions in a range of ways such as offering scholarships and in-kind contributions, collecting specimens and providing fish samples An example of this collaboration is the joint research project being undertaken by NSW Fisheries and the University of British Columbia which is designed to look into whole ecosystem simulations.

Contributing to Goals	Timeframe	Responsibility	Authority
1,6,8	Ongoing	NSW Fisheries other institutions	-

(c) Contribute to relevant biodiversity monitoring programs.

Background: There is no simple performance measure currently available to give an accurate representation of the impacts of the Ocean Hauling Fishery on biodiversity. 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.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,6,8	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: Numerous marine parks and aquatic reserves are being declared in NSW to protect and enhance marine and estuarine biodiversity. Three regions, Tweed-Moreton, Batemans Shelf and Lord Howe Province, have had marine parks declared.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,3,4,6,7	Current & ongoing	OH MAC	-

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

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

(f) Promote research on the impacts of the Ocean Hauling Fishery on the general environment, in particular, pursue the research priorities identified in section 6 of this management strategy.

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 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 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
1,2, 3, 7, 8	Ongoing	NSW Fisheries 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: The Minister for 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, during which a system of closures and monitoring was implemented in NSW. Fishing closures were also introduced in 2000/2001 to prevent hauling in estuaries infested by the noxious weed Caulerpa taxifolia*.*

NSW Fisheries has a pest program team which has three key responsibilities:

- *identifying pest species at high risk of establishment in NSW and developing pest incursion plans for those species*
- *conducting biodiversity surveys and assessing the potential impact of any identified alien species. Potentially high risk species would be recommended for listing as noxious under the FM Act*
- *developing appropriate control measures for noxious species and other established pests.*

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,6	Current & ongoing	NSW Fisheries OH MAC	To be determined

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

Ensuring that the species harvested by this fishery are fished at a level that minimises the risk of overfishing the stocks is vital. 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.

A review of the operation of the Ocean Hauling Fishery conducted in 2001 as part of the environmental assessment process highlighted several risks with respect to possible 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 to be addressed include the overfished status of garfish and silver trevally stocks and the need to promote stewardship over the fishery resources.

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; 2.5a,b,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 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. It is important to note that monitoring of catch at the Sydney Fish Market and at other fish processors provides information about all commercial landings of species, as opposed to simply landings of those species by the Ocean Hauling Fishery. This monitoring is generally done on a weekly basis, and contributes toward determining the

status of stocks, stock assessment information and may also assist in determining appropriate measures for recovery programs where needed, including minimum legal size limits.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,7,8	Ongoing	NSW Fisheries	-

(b) Develop stock assessments 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 and fishery performance, and will provide for more accurate determination of sustainable levels of harvest for those species. 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.

Because stock assessments are done on a species basis they are reliant on obtaining harvest estimates from all sectors and adjacent jurisdictions. Future fishery-independent survey work will contribute more robust data that can be factored into the stock assessment process. A stock assessment process will be designed within 12 months of the management strategy commencing.

The ongoing three year review of stock assessments is essential for ensuring the ongoing improvement of stock assessments and the research programs providing information for them. An important part of the review of stock assessments will include improvement of trigger points (biological reference points) for each species. See section 9.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,7,8	From 2003	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 1 and expand Appendix 1 to provide an explicit definition of all gear types used in Ocean Hauling Fishery.

Background: The Fisheries Management (General) Regulation 2002 *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 1 also provides the 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
1,2,4,5,6	By July 2003	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. Minimum legal lengths can be applied to target species, conditional target species or any other species taken in the fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5	Current & ongoing	NSW Fisheries	Regulatory

(e) Subject to approval by the Minister for Fisheries, provide for the development of species based resource plans and/or area based resource plans in consultation with the Ocean Hauling MAC, relevant stakeholders and the public as appropriate

Background: If there are found to be benefits in producing plans of management for particular species or areas relevant to the Ocean Hauling Fishery over and above the existing programs, the management strategy provides for their development subject to approval by the Minister for Fisheries.

An example of such plans may include the Estuary Management program for many of the State's estuary systems, which has been established by the NSW Government. Estuary Management Committees are formed and funded by Department of Land and Water Conservation and local council(s) with representation from State Government agencies (NSW Fisheries, National Parks and Wildlife Service, NSW Waterways, etc.) and local community interest groups

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4	As required	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: In early 1997 an attempt to cap escalating effort in the beach hauling sector of the fishery was undertaken by implementing a closure limiting the engine unit of boats used in beach-based activities to less than 45 horsepower. It is accepted that the technical calculation of horsepower allowed some fishers to install engines that met the rules but that were more efficient than those they replaced. Such effort creep is predictable and far from unusual, and reinforces the need for strategies and tools to address effort creep in input control fisheries.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	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
1,2,4,6	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 in the short-term 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.

Whilst fishing closures are generally established on a seasonal, time, area, operator or gear specific basis, they can also be established to prohibit the taking of a particular species, either totally or conditionally. Closures are usually implemented for a period of five years or less, and remain in place for that duration unless revoked beforehand. Guidelines will need to be developed in consultation with the Ocean Hauling MAC, for implementing temporary closures. Section 4 of this management strategy provides further information about fishing closures and the process for their declaration.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5	As needed	NSW Fisheries	Regulatory

(d) For all methods (other than purse seining) 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 and resource sustainability 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.

NSW Fisheries' status reports and stock assessments (as they become available) will be used to determine appropriate levels of access, which can then be adjusted using minimum shareholdings in the share management plan.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5,8	From December 2003	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. 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:

i. inclusion of permit holders in an appropriate code of conduct as a permit condition

ii. inclusion of permit holders in any observer programs required for the class C (purse seine) sector

iii. development of an appropriate reporting system for permit holders to document all bait harvest

iv. 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

v. 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

vi. 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

vii. 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
1,2,4,5,7,8	i) by December 2003, ii) by December 2004, iii) by July 2003, iv) immediate, v) by December 2004, vi) by December 2005, vii) by December 2004.	NSW Fisheries	-

(f) Develop and implement a policy (including reporting procedures) 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:

i. inclusion of permit holders in an appropriate code of conduct as a permit condition

ii. inclusion of permit holders in any observer programs required for the class C (purse seine) sector

iii. development of an appropriate reporting system for permit holders to document all bait harvest

iv. 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
1,2,4,5,7,8	i) by December 2003, ii) by December 2004, iii) by July 2003, iv) as required	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 4 (v) for more information on nominations.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5	By July 2004	NSW Fisheries	Regulatory

(h) Continue the licensing arrangements described in this management strategy (see section 4 of this management strategy).

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,6	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 take fish hauling from a boat as opposed to hauling from a beach is not comparable. Hauling from the beach involves a team of fishers (up to 10-15 people in some instances) 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	By July 2004	NSW Fisheries 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 current 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.

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

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5	By December 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
2,4,5	By July 2004	NSW Fisheries	Policy & Regulatory

(c) Continue with transfer guidelines that ensure the allocation of ocean hauling endorsements to new business owners is possible, only where that business previously held the relevant endorsement. It must also hold 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
2,4,5	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
1,2,6,7	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
1,2,5,6,7	Current & ongoing	OH MAC	-

(c) NSW Fisheries will continue to review, provide relevant advice and where appropriate under the *Fisheries Management Act 1994*, impose conditions, 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 its legislative powers under the FM Act, the Department has the ability to recommend the refusal of the development (if inconsistent with the FM 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
1,2,7	Current & ongoing	NSW Fisheries	EP&A Act FM 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 developing a recovery program for an overfished species initially involves NSW Fisheries preparing a summary of the known factors that have led

to the determination of 'overfished' being made. In addition to the summary, a range of management options, including (but not limited to) those outlined in management response 2.5c will be identified and outlined in an information paper. Consultation will then formally commence with the relevant MACs and advisory bodies. The recovery program will be developed under the management strategy for the fishery which is the key harvester of the species concerned. This process may commence with a trigger point review (explained in sections 3 and 9). The process of determination of a species status is described in section 3. Additional information on recovery programs for overfished species in presented in section 3 of this management strategy.

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)).

(a) Where the fishery is a major harvester of an overfished species, develop and implement a recovery program for the species within a specified timeframe.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,5,6	Recovery program drafted for consultation within 6 months	NSW Fisheries OH MAC	To be determined

(b) Where the fishery is a minor harvester of an overfished species, 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
1,2,4,5,6	As required	NSW Fisheries	To be determined

(c) During the development of a recovery program for a species that has been determined as being recruitment overfished, implement precautionary actions including but not limited to any of the following:

i. total harvest controls
ii. reductions in effort associated with the harvest of the species
iii. the implementation of fishing closures
iv. bycatch management provisions
v. 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
1,2,5,6	As required	NSW Fisheries	Various

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

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
2,6	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:

i. remove the method of garfish bullringing from the Ocean Hauling Fishery

ii. constrain garfish bullringing to estuaries only

iii. remove the garfish hauling method from the Estuary General Fishery

iv. 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 concern 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.

Further information on sea garfish is presented in section 3 of this management strategy, as well as in Appendix 3. A recovery program discussion paper will be presented to the relevant advisory groups, including the Ocean Hauling MAC, and this paper will include a precis of sea garfish to assist in the consultation over appropriate management of the species.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,6	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 sea 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
2,4,6	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
2,8	From December 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
1,2,4,5	By July 2004	NSW Fisheries	Regulatory

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

Background: The permissible mesh size in a garfish hauling net is currently 28mm, however, a concession to use 25mm mesh has been in place since 1995. The concession has permitted a tolerance of up to 3mm. The allowable mesh size for a garfish hauling net is presently between 28 mm and 85 mm. The intention of this management response is to ensure that the minimum operating size of garfish hauling nets in the fishery is 28 mm to prevent the capture of smaller, less mature fish from the population.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,5	From December 2002	NSW Fisheries	Policy

(j) Extend the November-February weekend closure on hauling to a year-round weekend 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
1,2,4	From December 2002	NSW Fisheries	Regulatory

Objective 2.5.2 To actively promote research programs that will improve stock assessment of sea garfish

(k) Implement appropriate size mesh restrictions following the study which describes the retention and rate of meshing by size for sea garfish in 28 mm and 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 implement 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
2,7,8	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: 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. If this study does not provide sufficient data on which to base long term management decisions about the recovery of sea garfish upon, additional research or more precautionary management controls will be needed.

Contributing to Goals	Timeframe	Responsibility	Authority
2,7,8	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

Activities that impact on species, populations or ecological communities that are listed as being threatened must, under several pieces of state and federal 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 and could include habitats that are critical to the survival of such animals.

While there are no firm data, it is thought that the impact of the Ocean Hauling Fishery on threatened species, populations and ecological communities is small. Nevertheless, it is important to quantify and monitor any threatened species interactions, and have a management framework that is adaptive to change in the event that impacts are identified and found to be unacceptable.

Objective 3.1 **To identify, 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 and captures of threatened or protected species.

Background: The guidelines for a "ecologically sustainable" fishery approved by the Commonwealth under the Environment 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 FM Act*, Threatened Species Conservation Act 1995 *and the EPBC Act.*

Contributing to Goals	Timeframe	Responsibility	Authority
3,6,7,8	By December 2002	NSW Fisheries All OH fishers	-

(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 little penguin colony at Manly or any other threatened species or populations identified as relying on these grounds for food supply.

Note: The recovery plans referred to in this response could include those being developed under the FM Act, the Threatened Species Conservation Act 1995 *or other State or Commonwealth legislation. The response recognises that the statutory provisions of a threatened species recovery plan must be implemented and given precedence over the provisions of this management strategy.*

Contributing to Goals	Timeframe	Responsibility	Authority
3,4	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 2002.*

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 some of those species also identified as endangered or vulnerable under Schedules 4 and 5, respectively, of the Fisheries Management Act 1994.

At the commencement of this management strategy, the marine and estuarine species of protected fish included Ballina angelfish, black rock cod, eastern blue devil fish, elegant wrasse, estuary cod, giant Queensland groper, grey nurse shark, Herbsts nurse shark, weedy seadragon, great white shark.

Fish protected from commercial fishing include (but are not exclusive to) marlin (black, blue and striped), groper (blue, brown and red), Australian bass and estuary perch.

The code of conduct to be developed for the fishery referred to in management response 4.5c(ii) could be used to prescribe best handling methods for releasing any protected fish, birds, reptiles or mammals that may be incidentally captured during fishing operations.

Contributing to Goals	Timeframe	Responsibility	Authority
3,4	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
3,4,6	As required	NSW Fisheries	Various

GOAL 4. To appropriately share the resource and carry out fishing in a manner that minimises social impacts

Most of the species taken by the Ocean Hauling Fishery are shared by fishers operating within the fishery (ie. among the different regions and endorsement types) and by other commercial and recreational fishing groups. The Ocean Hauling Fishery also operates on ocean beaches and in near shore ocean waters in close proximity to other users of the beaches and oceans and in areas of historical significance to Indigenous people. The zoning scheme introduced into the beach based sector of the fishery in 1995 solved many of the long standing social conflict issues that were prevalent in the fishery, as did the associated Ocean Hauling Code of Conduct. Despite these rules however, the social impact of the fishery continues to be an issue and is a matter that the management strategy aims to address.

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 and information from charter fishing boat logbooks.

Background: Final results from this survey were not available at the time of drafting the management strategy, but are expected to be available by 2002. Illegal catch includes any 'black market' catch sold by licensed commercial fishers or unlicensed fishers. So that all impacts on a species can be considered, estimates of harvest rates from all sectors are vital for stock assessments. The accuracy of estimates of non-commercial catch will impact directly on the robustness of stock assessment information. Information obtained through the implementation of this management response will, where appropriate, be considered in relevant stock assessments.

In November 2000, a licensing scheme was introduced for all marine and estuarine charter boat operators. These operators are required to record catches taken on board licensed charter vessels as part of a mandatory logbook program. Estimates of harvest rates from all sectors will be used in stock assessments.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,8	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 the management strategy, 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.

Any relevant Information obtained through the implementation of this management response will, where appropriate, be considered in relevant stock assessments.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	Current & ongoing	NSW Fisheries	Various

(c) Review the quantum of beach available to hauling in the Ocean Hauling Fishery and develop performance measures for monitoring and modifying that amount over time.

Background: This management response provides for a periodic review of the percentage of overall beach area available to the fishery, and the modification of that amount from time to time.

Section 4 of this management strategy includes information about the regional liaison process commenced in 1995 to discuss shared access to beach areas on a local scale. One of the outcomes of the process was to identify traditional hauling areas where the fishery operated, and other areas where the fishery did not, or rarely operated. Management response 4.5a(iv) in this management strategy includes using the outcomes of this process to promote harmony between operators in the Ocean Hauling Fishery and other resource users. Section 4 of this management strategy and the background to management response 4.5a include further information on the implementation of outcomes of the regional liaison process.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4	By December 2004	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) Evaluate catch levels and monitor management structures 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.

Section 3 of this management strategy includes information about a more coordinated approach (including meetings) to collaboration between NSW Fisheries and management agencies in Queensland, Victoria and the Commonwealth for shared species. Such an approach will assist in implementing this management response.

This management strategy 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
2,4,8	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 Fishery, Ocean Trap and Line Fishery).

Background: This management response may also provide information that will be considered in stock assessments as well as detecting changes in catch trends between sectors.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,8	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
4,5	By July 2004	NSW Fisheries	-

Objective 4.4 To minimise any negative impacts of the Ocean Hauling Fishery on Aboriginal or other cultural heritage

Other important responses: 4.1a; 6.4a

(a) Participate in the development and subsequent reviews of the Indigenous fisheries strategies.

Background: Consistent with objective 6.4, this management strategy is adaptive to a range of other concurrent programs, such as the Indigenous Fisheries Strategy.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6	As required	NSW Fisheries	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 National Parks and Wildlife Service (NPWS) is responsible for management of cultural heritage within NPWS estate and for the protection of Aboriginal objects on all lands.

Contributing to Goals	Timeframe	Responsibility	Authority
4	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:

i. protect key fish habitat, such as total beach closures

ii. reduce bycatch in places or at times when the amount of bycatch is unacceptable

iii. avoid direct interactions with marine and terrestrial threatened species, populations or ecological communities

iv. equitably share the resource between ocean hauling fishers and other stakeholders (including through the regional liaison process)

v. minimise impact on nesting and/or feeding areas of migratory birds

vi. minimise impact on sensitive ocean beach habitat.

Background: Fishing closures prohibit fishing over an area either absolutely or conditionally. In this management strategy all uses of the term "fishing closure" has a broad meaning encompassing any legally enforceable prohibition or restriction on fishing activity. This includes: fishing closures made under Division 1, Part 2 of the FM Act; aquatic reserve notifications made under Subdivision 3, Division 2, Part 7 of the FM Act; regulations under section 20 of the FM Act (as amended by the Fisheries Management Amendment Act 2001); regulations under section 220ZE of the FM Act; and regulations under section 205B of the FM Act.

Numerous 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 was 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, NPWS and a variety of community groups. Traditional hauling grounds and ocean hauling beach closures, specified 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 management strategy. This 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
1,2,4,6	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-based sector of the fishery, which outlines rules for:

i. operating on beaches that minimise environmental impacts in those areas

ii. operating in the vicinity of areas used by recreational fishers

iii. the use of gear and the behaviour of commercial fishers

iv. the appropriate handling methods for incidental catches of marine birds or mammals

v. encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken

vi. locally negotiated access and beach conduct rules or other locally negotiated rules as appropriate.

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 and input from other natural resource agencies (e.g. National Parks and Wildlife Service) will be sought when developing relevant parts of the code. The code of conduct should provide for regional codes and will be enforceable through the share management plan for the Ocean Hauling Fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,4,5,6,7	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 boat-based sector of the fishery and with respect to:

i. operating in the vicinity of areas used by recreational fishers or grounds subject to intense recreational bait gathering

ii. the use of best practice handling and release methods for incidental catches of protected fish, birds, reptiles, mammals, plants and algae, including aborting a shot if dolphins become encircled

iii. the use of gear and the behaviour of commercial fishers

iv. encouraging the use of effective value-adding and icing techniques to maximise the market price of product taken.

Background: Purse seine fishing and other boat-based fishing methods are not dealt with specifically in the existing code. A new code for boat-based 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 will also consider rules that provide for best practice on releasing incidental catches of marine birds or mammals.

The code of conduct for the boat based sector of the Ocean Hauling Fishery will be developed and periodically reviewed (and amended where necessary) by NSW Fisheries in consultation with the Ocean Hauling MAC. Input from other natural resource agencies (e.g. National Parks and Wildlife Service) will be sought when developing relevant parts of the code. The code of conduct should provide for regional codes and will be enforceable through the share management plan for the Ocean Hauling Fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,4,5,6,7	By December 2003	NSW Fisheries OH MAC	Regulatory

(d) Consult with the community on proposals for recognised fishing grounds, subject to and in accordance with the guidelines approved by the Minister for Fisheries, and implement the outcomes as appropriate.

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 that was established in 1995 has taken initial steps in identifying traditional hauling grounds in each ocean hauling region. Further information on recognised fishing grounds is provided in section 4 of this management strategy.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5,6	Ongoing	NSW Fisheries OH MAC	Regulatory

GOAL 5. To promote a viable commercial fishery (consistent with ecological sustainability)

In terms of gross value of production, the Ocean Hauling Fishery is worth approximately $5 million annually (not including revenue received from the export market which generally yields higher prices). With the progressive phase in of full cost recovery of attributable costs between year 2005 and 2008, ocean hauling fishers need to be in a position to fund a greater proportion of the management costs. Viable fishing businesses have a greater incentive to support long term management decisions that are needed for sustainability now and into the future.

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 will need to demonstrate that any bycatch issues arising from a new size limit can be managed sustainably.

Contributing to Goals	Timeframe	Responsibility	Authority
5	Ongoing	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 fed and visual pollution issues with local communities and other Government authorities. 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
5	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.

Background: The intention of this management response is to provide for the development of performance measures to monitor both the economic performance of the fishery at the individual fishing business level, and also the economic performance of the fishery as a whole. Monitoring only one of these measures in isolation of the other may not always portray an accurate representation of economic viability, and therefore may not provide a robust indicator of whether additional programs or adjustment are warranted. These indicators will be consistent with objective 8.3, which aims to increase knowledge of the economic and social aspects of the Ocean Hauling Fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
5,7	By July 2005	NSW Fisheries OH MAC	-

(c) NSW Fisheries will develop and implement, 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.

Full cost recovery contributes to/is an indicator of viable commercial fisheries operating in a sustainable way. 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, without Government subsidy, have a greater incentive to support long term management decisions that are needed now and into the future. From 2005, recovery of the costs that have been identified as attributable to industry will be progressively introduced over a further three year period.

Contributing to Goals	Timeframe	Responsibility	Authority
5,6	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 management strategy, each of the ocean hauling methods will have a designated list of species that may be targeted. The 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:

i. sustainability
ii. habitat
iii. other resource users.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,5,6	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*.

Background: The category 2 share management provisions allow for the allocation of shares with a 15 year term to eligible persons, and with a statutory right to compensation if the Government cancels the shares during their term. A category 2 share management fishery may be converted to a category 1 share management fishery in accordance with the Fisheries Management Act 1994.

A share management plan must be created and that plan must be fully reviewed within 10 years after commencement.

Contributing to Goals	Timeframe	Responsibility	Authority
5,6	By December 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
5,6	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
2,5,6	Current & ongoing	NSW Fisheries	Regulatory

GOAL 6. To ensure cost-effective and efficient ocean hauling management and compliance programs

Effective management and compliance programs are important to the successful implementation of the fishery management strategy. As full cost recovery is phased in to the Ocean Hauling Fishery in the coming years, it is important that programs are conducted in an efficient and cost-effective manner. This goal can be achieved through the cooperation of ocean hauling fishers, ongoing communication and consultation between NSW Fisheries and industry through the Ocean Hauling MAC, and promoting complementary management programs, with adjacent jurisdictions, and in particular, with the Commonwealth.

Objective 6.1 To maximise compliance with the Ocean Hauling Management Strategy

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: To assist in delivering regionally focussed compliance and advisory services, there are currently 19 Fisheries Offices along the NSW coast. Each of these offices provides services for a range of programs, one of which is the Ocean Hauling Fishery. The level and focus of services targeted towards the Ocean Hauling Fishery varies in each district, and is determined by the nature of the activities in that area. Fisheries officers in each office operate under a district compliance plan to ensure appropriate compliance coverage across all programs. District compliance plans are subject to fortnightly review to consider any changed circumstances and are also subject to an annual review.

Each district compliance plan is developed to be consistent with the compliance strategic plan for NSW Fisheries. This plan is an overarching framework that identifies priorities and objectives for compliance throughout the State. The Ocean Hauling MAC will be consulted over priorities relevant to the fishery prior to each review of the compliance strategic plan. The compliance strategic plan is subject to a review every three years

Contributing to Goals	Timeframe	Responsibility	Authority
2,6	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. Refer to section 5 for further details.

Contributing to Goals	Timeframe	Responsibility	Authority
2,4,6	By December 2003	NSW Fisheries	Regulatory Policy

(c) Publish, where appropriate, successful prosecution results for nominated offences in relevant publications and media to discourage illegal activity.

Contributing to Goals	Timeframe	Responsibility	Authority
6,7	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).

Contributing to Goals	Timeframe	Responsibility	Authority
5,6,8	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 "Authority to fish" when requested.

Contributing to Goals	Timeframe	Responsibility	Authority
6	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
6	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
4,6	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 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 management strategy.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5,6	Annual review	NSW Fisheries	-

Objective 6.4 To implement this management strategy 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 ecologically 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 management strategy will be operating alongside other programs relating to the management of marine resources, and must be consistent with those programs. The management strategy must be adaptive and able to be modified if inconsistencies between the programs become apparent.

Contributing to Goals	Timeframe	Responsibility	Authority
1,3,4,5,6	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 management strategy.

Background: Permits are required to use gear in a manner that is different to that specified in Appendix 1. Approval to trial new approaches to fishing gear design is commonly given to industry members participating in research. This provides a formal mechanism to operate in a manner other than as set out in the Fisheries Management Act 1994 *or regulation.*

Contributing to Goals	Timeframe	Responsibility	Authority
6,8	Current & ongoing	NSW Fisheries	FM Act

GOAL 7. To improve public understanding of the Ocean Hauling Fishery and of the resources upon which the fishery relies

Information needed by those who influence fisheries management and policy, as well as by those who have an interest in fishing is generally an issue identified as needing improvement throughout the world. One of the most important areas 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 have acknowledged a need to promote understanding of their operations in order to minimise misunderstandings in the community about bycatch and habitat interactions in their fishery.

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: The education strategy 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
4,6,7	By July 2003	NSW Fisheries	-

(b) Make the Fishery Management Strategy, Environmental Impact Statement and other relevant documentation widely available to the public by:

i. placing them on the NSW Fisheries website

ii. providing copies at Fisheries Offices throughout the State

iii. targeted mail outs to key stakeholders.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6,7	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
4,6,7	Ongoing	NSW Fisheries	-

(d) Respond to inquiries by industry or the public with respect to the management strategy or the fishery generally.

Contributing to Goals	Timeframe	Responsibility	Authority
4,6,7,8	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
4,6,7	Current & ongoing	NSW Fisheries	-

GOAL 8. To improve knowledge of the Ocean Hauling Fishery and the resources upon which the fishery relies

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. There is also a general lack of knowledge regarding the biology and status of many of the key species that needs to be rectified over the coming years.

Objective 8.1 To promote appropriate scientific research and monitoring to gain knowledge of target species and 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. Management response 8.1g includes the development of trigger points to detect concerning trends for all species taken in the Ocean Hauling Fishery. This system of trigger points is due to be implemented after the first annual performance review of the fishery. This management strategy provides for the application of those trigger points on a method of harvest basis for individual species. This may be done to increase the level of monitoring of a species that demonstrates concerning catch trends, or if the monitoring is deemed appropriate by the Director, NSW Fisheries for any other reason.

Contributing to Goals	Timeframe	Responsibility	Authority
4,7,8	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 1950s. 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
1,2,4,5,7,8	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
1,2,4,5,7,8	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 management strategy, 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.

Contributing to Goals	Timeframe	Responsibility	Authority
6,7,8	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 8.1d.

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. Shareholders will contribute to the costs of research programs in accordance with the cost recovery policy outlined in management response 5.2c.

Contributing to Goals	Timeframe	Responsibility	Authority
8	Ongoing	NSW Fisheries	-

(f) 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.

Background: A clear expression of the relative priorities for stock assessment work is essential to ensure the most effective use of resources used for stock assessment. Making priorities for stock assessment and other research publicly available helps other institutions (e.g. universities) in determining directions for future research that may benefit the fishery.

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

(g) Develop an objective system for defining and setting trigger points to detect concerning trends in landings of species taken in the Ocean Hauling Fishery.

Background: Unlike annual trigger points which are designed to detect dramatic changes over short periods, these trigger points will be 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). The assistance of a statistical expert will be sought to develop the system for setting this type of trigger point. The system will be tested during the first nine months following the commencement of the management strategy and applied to all species landed in the fishery at the first annual review. (See section 9 for a more detailed discussion on setting trigger points for monitoring changes in commercial landings). If the application of these trigger points for all species shows concerning trends for any conditional target species, the management strategy has provision to allow for increased monitoring or management controls for those species.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,8	Annually from 2003	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, NSW Fisheries within 28 days following the end of the month.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,7,8	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:

i. the data collected is perceived to be of poor quality or insufficient for the purpose of conducting an environmental or stock assessment, and/or

ii. 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.

A working group of commercial fishers and NSW Fisheries staff is reviewing catch and effort returns used by fishers. The working group will help to the current to improve the quality of data collected. Any proposed changes would be discussed with the Ocean Hauling MAC.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,6,7,8	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 management strategy. 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 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. The implementation of this management response will provide benchmark information to assist in implementing management response 8.2f, which aims to increase the accuracy of reported information by using individual species names wherever possible.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,6,7,8	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 travelling season (i.e March to July).**

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 gained to warrant a change in the recording for some hauling activities, particularly during the mullet travelling 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
1,2,4,6,7,8	Ongoing	NSW Fisheries	-

(e) Provide means by which ocean hauling teams can report fish observed but not caught.

Background: Beach-based hauling 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
1,2,7,8	July 2003	NSW Fisheries	-

(f) Increase the recording of individual landed species on catch records wherever possible

Background: The catch records database includes many references to unspecified fish of a particular species, (e.g. mullet, unspecified). The catch record category of mullet (unspecified) is believed to include landings of sea mullet, sand mullet and fantail mullet.

Increasing the accuracy of the reported landings of particular species will assist in the overall monitoring of those species. It is important, however, to acknowledge that requiring a resolution of information on catch records that is too high may indeed decrease the value of the data provided by forcing inaccurate identifications and entries. Implementation of this management response is to include consultation with the Ocean Hauling MAC to determine the most effective way of obtaining quality information, and may require changes to the catch records used in the fishery.

Contributing to Goals	Timeframe	Responsibility	Authority
1,2,4,8	From July 2003	NSW Fisheries and OH fishers	-

Objective 8.3 To improve knowledge of social and economic aspects of the fishery

Other important responses: 5.2a-c; 5.3a; 7.1a

a) Consult with the Ocean Hauling MAC on the development of a strategy for improving the understanding of economic and social information relating to the Ocean Hauling Fishery, taking into account the information gaps outlined in the economic and social assessment in the Environmental Impact Statement for the fishery.

Background: An economic and social survey conducted as part of the environmental assessment process has provided some limited information on economic and social issues in the Ocean Hauling Fishery. The Environmental Impact Statement identified a number of information gaps and provided recommendations for further investigation of economic and social issues.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5,7	By July 2005	NSW Fisheries	-

b) Assess, in consultation with the Ocean Hauling MAC, the feasibility of gathering additional information on social and/or economic aspects of the Ocean Hauling Fishery including:

i) modifying the existing catch returns or fishing licence renewal application forms

ii) undertaking targeted social and economic surveys

iii) any other methods of gathering the desired information

Background: The gathering of social and economic information will aid in understanding the implications of changes to fishing rules over time. Some information gathering methods may be relatively simple and inexpensive to implement whilst others, like targeted surveys, are likely to be more resource intensive. Consideration will need to be given to the quality of information likely to be received through different information gathering techniques.

Contributing to Goals	Timeframe	Responsibility	Authority
4,5,7	By July 2005	NSW Fisheries OH MAC	-

9. 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 management strategy 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 each of 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 performance indicators and associated monitoring programs are detailed later in this section in Table 15.

With the implementation of the new research proposals for the fishery outlined in section 6, a broader information base relating to the fishery and its impacts may allow for more precise performance indicators to be developed.

ii) Monitoring programs

Monitoring programs collect the information used to measure the performance indicators. Monitoring programs may be specific to the fishery, or encompass cross fishery interactions such as the catch of a species by several commercial fisheries or harvest sectors. Table 15 identifies the information sources and monitoring programs used as part of the performance monitoring and review process for the Ocean Hauling Fishery.

iii) Trigger points

The trigger points specify the point when a performance indicator has reached a level that suggests there may be a problem with the fishery and a review is required.

Some performance indicators vary naturally from time to time. Trigger point levels have been selected to be well within the expected natural range of variation. This means 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 so that the performance indicator will be outside the range where the 80% of most common observations fall.

Table 15 establishes the performance indicators and trigger points that will be used to measure whether each of the management goals described in section 4 of this management strategy are being attained.

Table 15. Performance indicators, monitoring programs and triggers points to measure the success of each of the goals of the fishery

GOAL 1. To manage the Ocean Hauling Fishery in a manner that promotes the conservation of biological diversity in the coastal environment					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
1.1	[Performance indicators need to be developed to monitor biodiversity impacts at the species, community and ecosystem levels]	A monitoring program for this indicator cannot be developed until a performance indicator has been selected		[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 1.3b, the development of performance indicators will involve extensive scientific collaboration and is likely to take some time.
1.2	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 2004 and review every two years	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
1.3	Response of the fishery to marine pest and disease incursions	Reports relating to the monitoring of marine pests and diseases will be provided to the Ocean Hauling MAC through the marine pest management program on results of monitoring marine pests and diseases	Ongoing	The Director, NSW Fisheries, determines 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. Section 210 of the FM Act provides on offence for selling noxious fish. This performance measure ensures that the fishery is responsive to existing or threatening marine pest or disease incursions.

GOAL 2. To maintain fish populations harvested by the Ocean Hauling Fishery at ecologically sustainable levels					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
2.1	Total annual commercial landings of the target species	Annual analysis by NSW Fisheries scientists, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns and other relevant data from adjacent jurisdictions, where available. Reports scrutinised in March/April and final report made available in June of each year	Begin 2003 and ongoing subject to annual review	See Table 3	A further set of trigger points in addition to those in Table 3 will be developed in order to detect undesirable trends in catch data (see section 5(g) of this management strategy)
2.2	Stock assessment of target species	Monitoring of commercial landings	Ongoing	See section 5(f)(i) of this management strategy	
		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		
2.3	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 2004 and ongoing subject to annual review	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
2.4	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		

GOAL 2. (Continued) To maintain fish populations harvested by the Ocean Hauling Fishery at ecologically sustainable levels					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
2.5	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		
2.6	Total commercial landings of non-target species from each method, in each region	Annual analysis by NSW Fisheries scientists, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2003 and ongong subject to annual review	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 and other landed species (byproduct)
2.7	Capability to limit effort through minimum shareholdings in place within two years of share management plan commencement	A review of the provisions of the share management plan with respect to minimum shareholdings will be conducted by NSW Fisheries and the MAC	2 years from the implementation of the share management plan	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
2.8	Total annual landings of species other than the target species	Annual analysis by NSW Fisheries scientists, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2003 and ongoing subject to annual review	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)	Catches for some byproduct have been reported as zero in previous years. Despite this, a zero catch recorded in any future year will be considered as outside the acceptable range specified in this strategy
2.9	Total annual commercial landings of each species from each gear type within each region fished	Annual analysis by NSW Fisheries scientists, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2003 and ongoing subject to annual review	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

GOAL 3. To promote the conservation of threatened species, populations and ecological communities associated with the operation of the Ocean Hauling Fishery					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
3.1	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	[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 intitially focus on species and/or locations most likely to be at risk to aid in the design of the overall
3.2	Response of the fishery to threatened species declarations	Reports will be provided to the Ocean Hauling MAC containing recommendations from the Director, NSW Fisheries and/or the Director-General of the National Parks and Wildlife Service where appropriate actions may be needed to conserve threatened species, populations and ecological communities.	Ongoing	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 management strategy	The NSW Fisheries Office of Conservation and NSW National Parks and Wildlife Service monitor sightings of threatened species and develop threatened species recovery plans as required

GOAL 4. To appropriately share the resource and carry out fishing in a manner that minimises social impacts					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
4.1	Estimates by NSW Fisheries of the catch of target species for all non-commercial sectors (including recreational, charter boat, aquaculture and Indigenous	Any relevant stratified creel surveys, analysis of charter boat logbooks, aquaculture records, discussions with Indigenous stakeholders and compliance reports	Begin 2005 and ongoing subject to annual review	Estimates not available within three years from the commencement of the management strategy	This relates to the need to have accurate harvest information from all sectors. This information will also be considered during the prearation of stock assessments
4.2	Catch levels (including estimates) from the commercial, recreational and Indigenous sectors	Annual analysis by NSW Fisheries, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2004 and ongoing subject to annual review	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
4.3	Catch levels of species taken in the Ocean Hauling Fishery, relative to other commercial fisheries and among regions within the fishery	Annual analysis by NSW Fisheries, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2004 and ongoing subject to annual review	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
4.4	Total annual commercial landings taken in each region	Annual analysis by NSW Fisheries, in consultation with the Ocean Hauling MAC, of NSW commercial catch returns	Begin 2003 and ongoing subject to annual review	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

GOAL 5. To promote a viable commercial fishery (consistent with ecological sustainability)					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
5.1	Annual 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 subject to annual review	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
5.2	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 subject to annual review	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 stabilised average share value may be a good indicator of economic status of the fishery
5.3	Viability of Ocean Hauling Fishery and businesses therein	Performance indicator and associated monitoring to be developed	From July 2005	[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

GOAL 6. To ensure cost-effective and efficient ocean hauling management and compliance programs					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
6.1	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 subject to annual review	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 management strategy. Significant increases in forfeiture and penalty point system offences will trigger appropriate responses under Goal 6
6.2	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 subject to annual review	Less than two meetings held in a calender year, unless otherwise agreed by the MAC	Holding 2 MAC meetings per year is currently a requirement of the Regulation
6.3	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 subject to annual review	Any occasion when the Director, NSW Fisheries, determines that this management 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
6.4	Performance of NSW Fisheries meeting needs of MAC as per the Commercial Fisheries MAC Procedures Manual	NSW Fisheries service agreement	Ongoing subject to annual review	NSW Fisheries fails to meet guidelines in 20% of communications with MAC	

GOAL 7. To improve public understanding of the Ocean Hauling Fishery and of the resources upon which the fishery relies					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
7.1	Annual publication of fishery information according to fishery education strategy	Strategy determines means and frequency of information dissemination	Ongoing subject to annual review	Annual publication missed or incomplete	
7.2	The development and implementation by NSW Fisheries in consultation with the MAC of an education strategy for the fishery		By July 2003	Education strategy not developed within two years of commencement of the management strategy	An education and communication strategy for the fishery will include what information is to be published and by what means

GOAL 8. To improve knowledge of the Ocean Hauling Fishery and the resouces upon which the fishery relies					
No.	**Performance indicator**	**Monitoring program**	**Time frame**	**Trigger point**	**Comments**
8.1	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 2004 and ongoing subject to annual review		
8.2	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 and ongoing subject to annual review	To be determined	Part of annual reporting on fishery status should include expenditure on research for the fishery
8.3	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 2003 and ongong subject to annual review	Less than two such applications submitted in a year	The outcome of such grant applications can not be guaranteed
8.4	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 2003 and ongoing subject to annual review	The Director, NSW Fisheries, determines 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
8.5	Rate of successful external research funding applications relating to the Ocean Hauling Fishery, measured as a percentage	No monitoring program will be identified until a performance monitor has been developed	To be determined	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

* Landings and benchmarks should not include catches taken in areas or by ear types that are not available to commercial fishers as a result of other programs that impact on the operation of the fishery (e.g. the declaration of recreational fishing areas or aquatic reserves).

b) Predetermined review of performance indicators and trigger points

It is likely that changes to the activities authorised under the management strategy 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 the management strategy. If new information becomes available as a result of research programs, more appropriate performance indicators and trigger points can be developed and the management strategy may be amended by the Minister for Fisheries accordingly.

A comprehensive review of the appropriateness of all performance indicators and trigger points will be carried out not more than two and a half years from the commencement of the management strategy, in consultation with the Ocean Hauling MAC.

As new or improved guidelines for fishery reporting become available, such as those being considered in the *'National ESD Reporting Framework for Australian Fisheries – the how to guide for wild capture fisheries report'*, they will be taken into account to promote continuous improvement in the management of the fishery.

c) Reporting on the performance of the management strategy

There are two types of reporting provided for under this management strategy. The first of these reports on each of the performance indicators specified for each management goal. The other type is reporting on the progress in implementing the provisions of the management strategy. Both types of reporting are discussed in further detail below.

i) Review report in response to trigger points

If the trigger point for a performance indicator is breached, a review is to be undertaken of the likely causes for the breach. Any such review is to include consultation with the Ocean Hauling MAC. In some circumstances, the breach may be related to a performance indicator that measures broader cross fishery issues and will require consultation with other management advisory committees or the Ministerial advisory councils. Cross fishery issues are most likely to involve catch levels of a species that is harvested in more than one fishery.

NSW Fisheries will collect and analyse information relevant to the performance of the fishery, such as compliance rates, economic data, catch data and other statistics as the information becomes available and prior to preparation of reports relating to performance monitoring in the management strategy. This does not, however, prevent a review from being conducted at any other time should it become apparent that a performance indicator has breached a trigger point.

Once the relevant information is obtained an initial analysis against the trigger points will be undertaken by NSW Fisheries. Where the data or information indicate that a trigger point has been breached, details will be provided to the relevant fishery MACs and the relevant Ministerial advisory councils. Consultation will then occur with the Ocean Hauling

MAC and other relevant advisory bodies either through a meeting or out of session. During this consultation, advice will be sought on performance indicators that have been breached and the suspected reasons for any breaches. During this consultation the MAC will also be able to provide advice on the preparation of any review reports that are required.

A review report outlining the remedial actions recommended in response to trigger point breaches, is to be provided to the Minister for Fisheries.

Reviews arising from landings data 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
- environmental factors.

Review reporting should include whether the suspected reasons for the trigger point being breached are the result of a fishery effect or an influence external to the fishery, or both.

If a review concludes that the reasons for the trigger point being breached are due to the operation of the fishery, or if the fishery objectives are compromised if the fishery continued to operate unchanged, management action must be taken with the objective of returning the performance indicator to an acceptable range within a specified time period. The nature of any remedial action proposed may vary depending on the circumstances that have been identified as responsible for the trigger point being breached.

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 fishery management strategy that allows 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 management arrangements or the management strategy 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 management strategy 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.

If a review considers that the management objectives or the performance monitoring provisions are inappropriate and need to be modified, the management strategy itself may be amended by the Minister for Fisheries. If the reasons are considered to be due to impacts on

the resource from factors external to the fishery, these factors should be identified in the review and referred to the relevant managing agency for action.

All review reports will be publicly available.

ii) Annual performance report

An annual performance report assessing the performance of the fishery will be submitted to the Minister for Fisheries each year following the review of trigger points by the MAC. This is to commence in 2004 and the report is to be submitted to the Minister for Fisheries within six months of the Ocean Hauling MAC being consulted over the development of the report. The annual performance report is the formal mechanism for reporting on performance indicators and trigger points, and will be made publicly available. This report will also include a review of progress made in implementing each of the management responses. The annual performance report will be submitted to the Minister for Fisheries in conjunction with performance reports for other relevant fishery management strategies.

The vast majority of management responses in the management strategy 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.

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[2].

The fishery will continue to be regarded as being managed within the terms of the management strategy 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.

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 management strategy in circumstances declared by the Minister for Fisheries 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. The Minister may also amend this fishery management strategy if matters identified during the finalisation of any other fishery management strategy indicate that a modification is necessary.

[2] In some circumstances a required action may be completed outside the scheduled timeframe, but prior to the commencement of the review (e.g. an action was due for completion by September 2003, but it is actually completed in October 2003). When this occurs, it is not necessary to proceed with a review.

Notwithstanding the above, the Minister may also make amendments to the management strategy that the Minister considers to be minor in nature at any time.

e) 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 management strategy a stock assessment process for target species will be developed. The process needs to be appropriately based on 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 three 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.

f) 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 management strategy, 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 management strategy.

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?)

The assistance of a statistical expert has been sought to develop an objective system for defining trigger points that detect concerning trends in landings. The system will be developed and tested during the first nine months of the management strategy and applied to all species taken in the fishery when the first performance report is prepared. The system may involve several different measures, including the steepness of the trend and the period over which the trend occurs.

g) How trigger points based on landings will be applied

The single year trigger is explained in the examples shown in Figure 3. These examples below explain how the single year trigger points will work with a hypothetical starting point (five years ago), trigger levels and existing catch data.

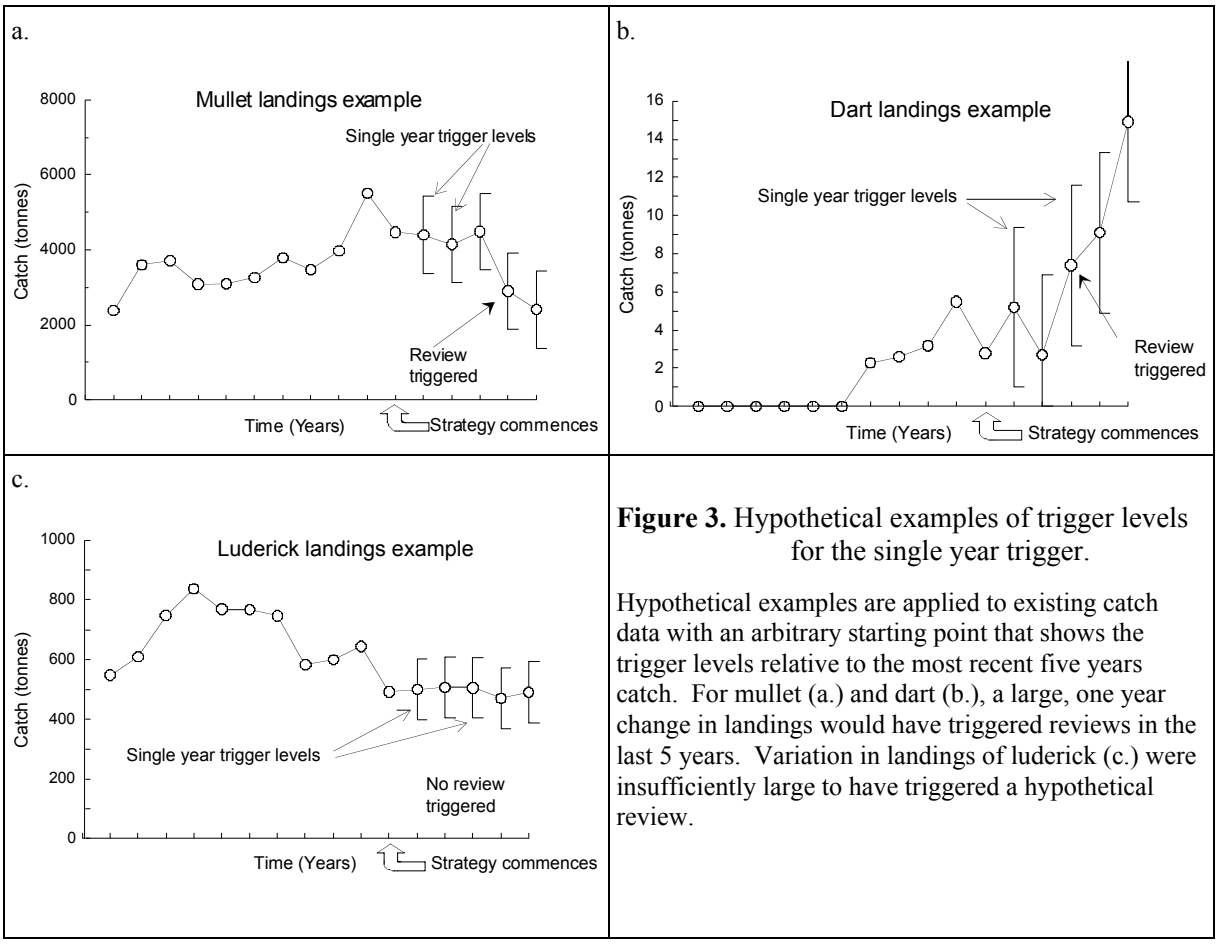


Figure 3. Hypothetical examples of trigger levels for the single year trigger.

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 16. Levels of trigger points for single year trigger.

Note: These levels will apply for the first year of the management strategy 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. Please note that reference to 'CI' in the Average annual change column refers to 'confidence intervals'

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

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Appendix 1 Description of ocean hauling gear

General conditions

(i) Variation to the ocean waters boundary occurs along the coast. Please refer to the Fisheries Management (General) Regulation 2002 for a detailed definition of ocean waters along the NSW coast.

(ii) Variations to regulated ocean hauling activities may occur in waters deemed as marine protected areas, aquatic reserves or Intertidal Protected Areas.

(iii) Species identified as threatened species, endangered species or vulnerable species under Schedules 4 and 5 of the *Fisheries Management Act 1994* cannot be taken in ocean hauling operations.

(iv) Where Australian salmon is listed as a target species, it may only be targeted south of Barrenjoey headland.

(v) Species with a prohibited size limit may be taken in a general purpose hauling net, however, only when greater than the applicable size limit.

Table 1. Hauling net (General Purpose).

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters and sea beaches	Ocean waters and sea beaches
Time		**24 hour operations subject to seasonal and weekend closures**
General Description	Includes hauling lines The length of each hauling line does not exceed total length of the net to which it is attached	Includes hauling lines The length of each hauling line does not exceed total length of the net to which it is attached
Total Length	1 March to 31 July each year- maximum 400 m	1 March to 31 July each year- maximum 400 m
Mesh size, Bunt or Wings	**1 August to 28 February** Mesh of wings not < 80 mm Mesh of Bunt not < 50 mm Bunt not > 1/3 total net length **1 March to 31 July each year** Mesh of wings 65 to 86 mm Mesh of bunt 50 to 65 mm Bunt not > 1/3 total net length	**1 August to 28 February** Mesh of wings not < 80 mm Mesh of Bunt not < 50 mm Bunt not > 1/3 total net length **1 March to 31 July each year** Mesh of wings 65 to 86 mm Mesh of bunt 50 to 65 mm Bunt not > 1/3 total net length
Rings ?		**No Rings**
Method of Use	The net is used only by the method of hauling The hauling net, once shot (any part other than the hauling line) is continued without interruption or delay until completed upon which any fish are immediately removed	**To be shot from to the beach and retrieved to the beach** The net is used only by the method of hauling The hauling net, once shot (any part other than the hauling line) is continued without interruption or delay until completed upon which any fish are immediately removed
Relationship to Boat		
Target Species	All species	**Sea mullet, Australian salmon , luderick, yellowfin bream, unspecified mullet, dart, blue mackerel, sand whiting**
Conditional Target Species		**Leadenall (frigate mackerel), fantail mullet, mackerel tuna, mulloway, northern bluefin tuna, tarwhine, bonito, silver trevally, diamond fish, yellowfin tuna, sweep, spanish mackerel, bigeye tuna**
Byproduct Limit		**In each region for each method (net type), no more than 5% of the annual landed catch must be comprised of byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species. However, the total weight of any conditional target species may exceed 20% in a given shot**
Minimal No. of Fishers Required	The net is operated by at least two commercial fishers	The net is operated by at least two appropriately endorsed commercial fishers
Additional Conditions	The net has a bunt in the centre and two wings of equal length OR the bunt is located between the end of the net first cast or shot and the centre of the net.	The net has a bunt in the centre and two wings of equal length OR the bunt is located between the end of the net first cast or shot and the centre of the net.

Table 2. Hauling net (General Purpose) in Jervis Bay.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	All other waters (except inland waters)- includes Jervis Bay	**Jervis Bay**
Time		**24 hour operations subject to seasonal and weekend closures**
General Description	Includes hauling lines	Includes hauling lines
Total Length	Maximum length- 375 m	**1 August to 28 February** Maximum length- 375 m **1 March to 31 July** Maximum length- 400 m
Mesh size, Bunt or Wings	Bunt does not exceed 90 m or 1/4 of total length of net (whichever is lesser) centre piece not > 50 m nor < 25 m in length Mesh- not > 50 m in length Remainder of bunt- not > 50 m, mesh not < 50 mm Mesh of wings- not < 80 mm	**1 August to 28 February** Bunt does not exceed 90 m or 1/4 of total length of net (whichever is lesser) centre piece not > 50 m nor < 25 m in length Mesh- not > 50 m in length Remainder of bunt- not > 50 m, mesh not < 50 mm Mesh of wings- not < 80 mm **1 March to 31 July each year** Mesh of wings 65 to 86 mm Mesh of bunt 50 to 65 mm Bunt not > 1/3 total net length
Rings ?		No rings
Method of Use	The net is used only by the method of hauling. The hauling net, once shot (any part other than the hauling line) is continued without interruption or delay until completed upon which any fish are immediately removed	**To be shot from to the beach and retrieved to the beach** The net is used only by the method of hauling. The hauling net, once shot (any part other than the hauling line) is continued without interruption or delay until completed upon which any fish are immediately removed
Relationship to Boat		
Target Species	All species	**Sea mullet, Australian salmon , luderick, yellowfin bream, unspecified mullet, dart, blue mackerel, sand whiting**
Conditional Target Species		**Leadenall (frigate mackerel), fantail mullet, mackerel tuna, mulloway, northern bluefin tuna, tarwhine, bonito, silver trevally, diamond fish, yellowfin tuna, sweep, spanish mackerel, bigeye tuna**
Byproduct Limit		**In each region for each method (net type), no more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct or conditional target species**
Minimal No. of Fishers Required	The net is operated by at least two commercial fishers	The net is operated by at least two appropriately endorsed commercial fishers
Additional Conditions	The net has a bunt in the centre and two wings of equal length	The net has a bunt in the centre and two wings of equal length

Table 3. Garfish Net (Bullringing).

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	All other waters (excluding inland)	**The Ocean Hauling MAC have recommended that this net be restricted to estuary waters only and become solely a part of the Estuary General Fishery**
Time		
General Description		
Total Length	Maximum length- 275 m	
Mesh size, Bunt or	Mesh throughout- not < 28 mm nor > 36 mm	
Rings ?		
Method of Use	The net must be cast in a circle, immediately splashing the water in the vicinity, then picking up the net, all of which is to be completed in a continuous operation	
Relationship to Boat		
Target	Garfish	
Byproduct		
Minimal No. of Fishers		
Additional Conditions	The net is used between 1 February and 30 November each year	

Table 4. Garfish Net (Hauling).

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters and sea beaches	Ocean waters and sea beaches
Time		
General Description		
Total Length		**Maximum length- 300 m with rope not > 300 m**
Mesh size, Bunt or Wings	Mesh throughout- not < 28 mm nor > 85 mm	Mesh throughout- not < 28 mm nor > 85 mm **No mesh size tolerance**
Rings ?		**No rings**
Method of Use	The net is used only by the method of hauling In offshore ocean waters the net is not landed by any method other than onto the tray of a boat	**For beach based- shot and hauled to and from the shoreline** The net is used only by the method of hauling **For boat based-shot & hauled to and from a boat** In offshore ocean waters the net is not landed by any method other than onto the tray of a boat
Relationship to Boat		**Only one boat to be used in the operation of the net** **Cannot haul from a boat whilst it is under power**
Target Species	Garfish	**Sea garfish**
Byproduct Limit	All other fish besides prohibited size fish taken while taking garfish	**In each region for each method (net type), no more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species** Any species of fish with a prohibited size limit cannot be landed
Minimal No. of Fishers Required		**The net is to be operated by at least two appropriately endorsed commercial fishers**
Additional Conditions		**Once shot, the net must be retrieved in a continuous motion**

Table 5. Garfish Net (Hauling) in Jervis Bay.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	That part of Jervis Bay within NSW, together with all the bays and beaches of that part, generally westerly from a line drawn between Point Perpendicular & Bowen Island	That part of Jervis Bay within NSW, together with all the bays and beaches of that part, generally westerly from a line drawn between Point Perpendicular & Bowen Island
Time		
General Description		
Total Length		**Maximum length- 300 m with rope that's not > 300 m**
Mesh size, Bunt or Wings	Mesh throughout- not < 28 mm nor > 36 mm	Mesh throughout- not < 28 mm nor > 36 mm
Rings ?		**No rings**
Method of Use	The net is used only by the method of hauling	**For boat-based - shot & hauled to and from a boat.** **For beach-based - shot and hauled to and from the shoreline**
Relationship to Boat		**Only one boat to be used in the operation** **Cannot haul from a boat whilst it is under power**
Target Species	Garfish	**Sea garfish**
Byproduct Limit	All other fish besides prohibited size fish taken while taking garfish	**In each region for each method (net type), no more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species** Any species of fish with a prohibited size limit cannot be landed
Minimal No. of Fishers Required		**The net is operated by at least two appropriately endorsed commercial fishers**
Additional Conditions		**Once shot, the net must be retrieved in a continuous motion**

Table 6. Pilchard, Anchovy and Bait Net.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters and sea beaches	Ocean waters and sea beaches
Time		**24 hour operations subject to seasonal and weekend closures**
General Description	Includes hauling lines	**Includes hauling lines with maximum length 500 m each**
Total Length		**Maximum length- 300 m**
Mesh size, Bunt or Wings	Mesh throughout- not < 13 mm	Mesh throughout- not < 13 mm
Rings ?		**No rings**
Method of Use	The net is used only by the method of hauling	The net is used only by the method of hauling **For boat-based- shot & hauled to and from a boat** **For beach-based- shot and hauled to and from the shoreline**
Relationship to Boat		**Cannot haul from a boat whilst it is under power**
Target Species	Pilchards, anchovies, slimy mackerel	**Pilchard, sandy sprat (whitebait & glass fish), blue mackerel, yellowtail, anchovy**
Byproduct Limit	All other fish besides prohibited size class of fish, garfish or prawns	**In each region for each method (net type), no more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species** Garfish, prawns or any species of fish with a prohibited size limit cannot be landed
Minimal No. of Fishers Required		**The net is to be operated by at least two appropriately endorsed commercial fishers**
Additional Conditions		**Once shot, the net must be retrieved in a continuous motion**

Table 7. Purse Seine Net.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters	Ocean waters
Time		**24 hour operations subject to time and area**
General Description		**Any net with rings or purse rope is deemed to be a purse seine net** **A purse seine net is a net with a cork line and leadline with rings attached to the leadline**
Total Length		**Either maximum length- 1000 m or as prescribed by the net registration (whichever is less)**
Mesh size, Bunt or Wings	Mesh throughout- not > 150 mm	Mesh throughout- not > 150 mm
Rings ?		**Along the length of the leadline**
Method of Use		**To be shot and retrieved to the same vessel, continuous shot**
Relationship to Boat		**Net must be shot from a boat and retrieved to a boat**
Target Species		**Blue mackerel, yellowtail, pilchard, sweep, jack mackerel, Australian salmon, anchovy, sandy sprat (whitebait and glass fish), silver trevally, bonito**
Byproduct Limit	All fish other than prohibited size class of fish, garfish, kingfish, tuna or prawns	**No more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species** Garfish, kingfish, tuna, prawns or any species of fish with a prohibited size limit cannot be landed
Minimal No. of Fishers Required		
Additional Conditions		

Table 8. Purse Seine Net in Jervis Bay and Twofold Bay.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Twofold Bay & Jervis Bay	Twofold Bay & Jervis Bay
Time		**24 hour operations subject to time and area closures**
General Description		**Any net with rings or purse rope is deemed to be a purse seine net** **A purse seine net is a net with a cork line and leadline with rings attached to the leadline**
Total Length	Maximum length- not > 275 m	Maximum length- not > 275 m
Mesh size, Bunt or Wings		**Mesh throughout- not > 150 mm**
Rings ?		**Along the length of the leadline**
Method of Use		**To be shot and retrieved to the same vessel, continuous shot**
Relationship to Boat		**Net must be shot from a boat and retrieved to a boat**
Target Species	All fish other than prohibited size class of fish, garfish, kingfish, tuna or prawns	**Blue mackerel, yellowtail, pilchard, sweep, jack mackerel, Australian salmon, anchovy, sandy sprat (whitebait and glass fish), silver trevally, bonito**
Byproduct Limit		**No more than 5% of the annual landed catch can be byproduct species (all other species). On a shot-by-shot basis, not more than 20% of the catch can be byproduct species** Garfish, kingfish, tuna, prawns or any species of fish with a prohibited size limit cannot be landed
Minimal No. of Fishers Required		
Additional Conditions		

Additional Gear Managed by the Ocean Hauling Fishery

Table 9. Purse Seine Net (Section 37 Permit).

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters	Ocean waters only
Time	Permit issued for a year, must renew to continue	Permit issued for a year, must renew to continue
General Description	Must use registered purse seine net	**Any net with rings or purse rope is deemed to be a purse seine net** **A purse seine net is a net with a cork line and leadline with rings attached to the leadline** Must use registered purse seine net **(registered in NSW)**
Total Length		
Mesh size, Bunt or Wings	Mesh throughout- not > 150 mm	Mesh throughout- not > 150 mm
Rings ?		**Along the length of the leadline**
Method of Use		**To be shot and retrieved to the same vessel, continuous shot**
Relationship to Boat	May only be used from vessel specified on permit	May only be used from vessel specified on permit **and that vessel must be licensed in NSW**
Target Species	Pilchards (only where specified on permit), yellowtail, blue mackerel	Pilchards (only where specified on permit), yellowtail, blue mackerel
By-product Limit	None	None
Minimal No. of Fishers Required		
Additional Conditions	Permit is only current whilst holding Commonwealth permit Cannot take fish for sale Copy of permit must be carried at all times Yellowtail and blue mackerel may be retained and frozen for later use Pilchards may only be taken if on permit, and then only used as live bait for poling	**Can only use whilst holding a current State permit** State permit is only current whilst holding a current Commonwealth permit Cannot take fish for sale Copy of permit must be carried at all times Yellowtail and blue mackerel may be retained and frozen for later use Pilchards may only be taken if on permit, and then only used as live bait for poling **Must submit monthly catch return form recording bait taken in NSW waters**

Table 10. Submersible Lift Net (Bait).

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Ocean waters	Ocean waters
Time		
General Description		
Total Length	Maximum- 15 m length, 15 m width	Maximum- 15 m length, 15 m width
Mesh size, Bunt or Wings	Mesh throughout- not < 13 mm nor > 25 mm	Mesh throughout- not < 13 mm nor > 25 mm
Rings ?		
Method of Use		
Relationship to Boat		
Target Species	Blue mackerel, yellowtail and pilchards	Blue mackerel, yellowtail and pilchards
By-product Limit	None	None
Minimal No. of Fishers Required		
Additional Conditions	Only for the use as bait in the taking of tuna Not within 300 m from Park Beach bombora (153°9'08", 30°17'82") or within 200 m of Cook Island, Merimbula fishing platform and Tathra wharf	Only for the use as bait in the taking of tuna Not within 300 m from Park Beach bombora (153°9'08", 30°17'82") or within 200 m of Cook Island, Merimbula fishing platform and Tathra wharf

Table 11. Submersible Lift Net (Bait) in Jervis Bay and Twofold Bay.

Parameters	Current regulated definition	Recommended amendments to regulated definition
Area	Twofold Bay & Jervis Bay	Twofold Bay & Jervis Bay
Time		
General Description	Not within Twofold Bay west of a line between Snug Cove and Cattle Bay	Not within Twofold Bay west of a line between Snug Cove and Cattle Bay
Total Length	Maximum- 15 m length, 15 m width	Maximum-15 m length, 15 m width
Mesh size, Bunt or Wings	Mesh throughout- not < 13 mm nor > 25 mm	Mesh throughout- not < 13 mm nor > 25 mm
Rings ?		
Method of Use		
Relationship to Boat		
Target Species	Blue mackerel, yellowtail and pilchards	Blue mackerel, yellowtail and pilchards
By-product Limit	None	None
Minimal No. of Fishers Required		
Additional Conditions	Only for the use as bait in the taking of tuna	Only for the use as bait in the taking of tuna

Appendix 2 Closures affecting ocean hauling operations

Table 1. Beach Closures.

The following table is one section 8 closure under the Regulation covering beach closures in the Ocean Hauling Fishery first implemented 21 February 1997.

Region	Closed Beaches	Period of Closure
Region 1 *That part of NSW lying generally between the border between QLD and NSW and the parallel 29° 15' south latitude*	All beaches bounded by Point Danger at Tweed Heads south of Goanna Headland (Evans Headland)	From 8 am Easter Friday to 12 midnight on Easter Sunday in each of the years 2002-2006
Region 2 *That part of NSW lying generally between the parallel 29° 15' south latitude and the parallel 29° 45' south latitude*	Bluff Beach (Iluka)	From 1 December each of the years 2002-2005, to 31 January in each succeeding year
	All beaches bounded by the southern breakwall of the Clarence River at Yamba, south to the vehicle access point at Pipi Beach, Yamba, with the exclusion of Convent Beach All beaches bounded by Angourie Point south to Rock Point (Entrance to Lake Arragan)	From 1 March in each of the years 2002-2005, to the last day in February in each succeeding year
Region 3 *That part of NSW lying generally between the parallel 29° 45' south latitude and the parallel 31° 44' south latitude*	Station Creek Beach (North of Red Rock) Main Beach (Nambucca Heads) Grassy Beach bounded by Grassy Head and Middle Head Smokey Cape- Laggers Point south to a point due west of Black Rocks (approx. 3000 m south of Smokey Cape) Town Beach (Port Macquarie) Flynns Beach Shelley Beach Miners Beach Lighthouse Beach- That part from the southern extremity of Taking Point south to Watonga Rock	From 1 October in each of the years 2002-2005 to the last day in February in each succeeding year
	Grants Beach (North Haven Beach)- That part from the northern breakwall to Camden Haven Inlet for a distance of 1000 m	From 1 December in each of the years 2002-2005, to 31 January in each succeeding year
	Hat Head Beach- that portion of Hat Head Beach for a distance of approx. 100 m from Korogoro Creek mouth north to pedestrian access No. 6	Between official sunrise and sunset in the period from 15 December in each of the years 2002-2005 to 31 January in each suceeding year

Table 1 (cont.).

Region	Closed Beaches	Period of Closure
Region 4 *That part of NSW lying generally between the parallel 31° 44' south latitude and the parallel 33° 25' south latitude*	Main Beach (Forster) Pebbly Beach Boomerang Beach (Pacific Palms) Blueys Beach Koolgardie Beach All beaches bounded by Nobby's Head and the southern extremity of Dudley Beach Gravelly Beach Moonee Beach	From 1 March 2002 to 28 February 2005
Region 5 *That part of NSW lying generally between the parallel 33° 25' south latitude and the parallel 34° 20' south latitude*	Whale Beach Avalon Beach Bilgola Beach Bungan Beach Basin Beach Mona Vale Beach Warriewood Beach Turimetta Beach Narrabeen Beach Collaroy Beach Dee Why Beach Manly Beach All ocean beaches bounded by South Head to Cape Banks	From 1 November in each of the years 2002-2005 to the last day in February in each succeeding year
Region 6 *That part of NSW lying generally between the parallel 34° 20' south latitude and the parallel 35° 25' south latitude*	Coalcliff Beach Scarborough Beach Wombarra Beach Austinmer Beach Boyds Beach Grenfield Beach Culburra Beach All beaches bounded by the northern extremity of Cudmirrah Beach to the northern extremity of Monument Beach	From 1 March 2002 to 28 February
Region 7 *That part of NSW lying generally between the parallel 35° 25' south latitude and the border between the States of New South Wales and Victoria*	All beaches bouded by the southern extremity of Wimbie Beach and the northern extremity of Rosedale Beach All beaches bounded by Tanrandore Point south to Tuross Head All beaches bounded by Mummaga Head (Dalmeny) south to Duesburys Point All beaches bounded by the southern extremity of Kianga Beach at the entrance of Kianga Lake, to Glasshouse Rocks (Narooma) Armonds Bay Beach Bunga Beach bounded by Goallen Head and Bunga Head All beaches bounded by Bengunnu Point and the northern extremity of Picnic Beach Merimbula Beach-That part from the northern extremity of Merimbula Beach generally southerly for a distance of 200 m	From 1 March 2002 to 28 February 2005

Table 2. Additional Closures.

The following table includes additional section 8 or section 11 closures under the Regulation affecting ocean hauling operations

Method	Waters	Time	Period
By means of nets of every description, except the dip or scoop net and the landing net prescribed by Regulation	The whole of the waters of that part of Front Beach, Trial Bay, extending from the western most extremity of the beach generally easterly for 800 m	From 20 December to 31 January each year	For a period of five years from 21 January 2000
By means of nets of every description, except the dip or scoop net, hand hauled prawn net and the landing net prescribed by Regulation	Includes the waters of the South Pacific Ocean, south of a line drawn from the National Parks and Wildlife sign "Hat Head Beach" 119 degrees to the northern point of Little Nobby	Total	For a period of five years from 6 August 1999
By means of nets of every description	Waters of that part of the South Pacific Ocean adjacent to Airforce Beach, enclosed by a line drawn from the most northerly point of the northern breakwall, north to the vehicle access to the beach (approximately 100 m north of the Evans Head Surf Club)	From 1 November in each of the years 1997 to 2002, to 31 January in each succeeding year	From 1997 to 2002
All methods	All waters from mean high water mark of Cook Island to a boundary defined by five marker buoys (co-ordinates outlined in notification)	Total	From 2 July 1999
All methods	Jones Point, North Solitary Island, North Solitary Island, North West Rock, North West Solitary Island (sanctuary zones for each area)	From 7 January 2000 to official sunrise 1 July 2002	N/A
By means of nets of every description, except the dip or scoop net, hand hauled prawn net, push or scissors net, hoop or lift net and the landing net prescribed by Regulation	The whole of the waters of that part of Byron Bay, South Pacific Ocean, situated south-west of Cape Byron and known as Little Beach (or Wategos Beach)	During the period of 1 April to 30 June in each year	For five years from 29 October 1999
By means of nets of every description, except the landing net prescribed by Regulation	The whole of the waters of that part of the South Pacific Ocean adjoining Brooms Head Beach at Brooms Head extending out 183 m from the high-water mark between Cakora Point or Brooms Head and line being the north-easterly prolongation of the north-western boundary of the sub-division at Brooms Head	From 15 December to 15 January each ensuing year	For five years from 29 October 1999
By means of nets of every description, except the landing net, as prescribed by the Regulation	The whole of the waters enclosed by a line from the eastern extremity of the southern breakwater at Forster, generally southeast to a point on highwater mark adjacent to the northern end of Boundary Street, Forster. *Conditions for use of garfish net (south of Haydens Rock) outlined in notification	Total	For a period of five years from 30 October 1998

Table 2 (cont.)

Method	Waters	Time	Period
Nets of every description	Little Coogee Bay, Clovelly	Total	From 11 January 2002 to 10 January 2007
By means of all spears, spear guns and similar devices, and net of every description, except the dip or scoop net and landing net, as prescribed by the Regulation	Lord Howe Island. The whole of the waters of the western side of Lord Howe Island between the coral reef and the mainland of the said island and being the waters known as the Lagoon, including the bays, inlets and creeks of the said lagoon	Total	For a period of five years from 23 March 2001
Nets of every description, other than by certain recreational nets	Certain waters of Port Hacking (Hungry Pt to Bass & Flinders)	6am on Saturday to 6am on Monday and from 6 am to 6pm on any weekday or public holiday	For a period of five years from 17 September 1999
General purpose haul nets	Sydney Harbour entrance waters	From noon on Saturday of each week to 8 am Monday and public holidays	For a period of five years from 11 December 1998
All nets except a landing net as prescribed in the Regulation	Shell Harbour (for that area extending into ocean waters)	Total	For a period of five years from 6 August 1999
All nets except a landing net as prescribed in the Regulation	Port Kembla and Outer Harbour	Total	For a period of five years from 13 August 1999
All nets except a landing net as prescribed in the Regulation	Merimbula and Tathra Platforms	Total	For a period of five years from 10 December 1999
Purse seine nets	Black Road Bait Ground (North Narrabeen)	Total	For a period of five years from 9 June 2000

Table 3. General additional closures affecting the Ocean Hauling Fishery.

The following table includes general Section 8 or Section 11 closures under the Regulation that may affect ocean hauling operations

Closure	Period
Taking of invertebrates from Intertidal Protected Areas	From 1 January 2002 to 31 December 2003
All commercial fishing without holding an endorsement	Continuous from 21 July 2000
Shark finning	Continuous from 4 June 1999
The taking of great white sharks	Continuous from 24 January 1997
Commercial fishing from boats in offshore waters without appropriate endorsements	For a period of 5 years from 8 October 1999
Powered fishing vessel restriction	For a period of 5 years from 28 February 2002
Taking Australian salmon and tailor by nets	For a period of 5 years from midnight 31 August 2001

Regional liaison process closures.

The following areas of beach are closed as a result of implementation of the outcomes of the regional liaison process.

Norries Headland Beach - from Norries Headland to 400m north

Golden Beach - between Gloria Street and North Head Road

Brunswick River - 1000m either side of the mouth of the Brunswick River

Watego's Beach - between Fisherman's Lookout and Cape Byron

Little Watego's Beach - between Fishermen's Lookout and Cape Byron

Broken Head - between Cocked Hat Rock to Jews Point

Boulder Beach - south of Byron St Lennox Head boat ramp to Whites Head

Shelly Beach - between Black Head and Ballina Head

Airforce Beach - 402 metres north from the breakwall at Evans Head

Part Woody Bay - 250m west from Woody Head

Turners Beach (Yamba) - between Clarence Head and the southern wall of the Clarence River

Yamba Beach - from Clarence Head to rock outcrop north of Convent Beach

All beaches bounded by Angourie Bay south to Rocky Point (entrance to Lake Arragan)

Corindi - 1 km south of Corindi River (from Red Rock)

Corindi Beach - between 1km north and 2km north of Arrawarra Headland

Mullaway Beach - between Ocean View Headland and Mullaway Headland

All beaches bounded by Green Bluff and Diggers Head

Park Beach - between Little Muttonbird Island to Macauleys Headland

Hungry Head - 1km south from the southern training wall of the Bellingen River

Nambucca Heads - from the southern end of Shelly Beach (Cliffy Point) to the northern end of Beilbys Beach

Forster Beach - south of the mouth of the Nambucca River for 1km

Grassy Beach - from Grassy Head to Scotts Head

Smoky Cape - from Laggers Point to 3km south of Smoky Cape

Hungry Hill - from Korogoro Point to 3km south of the Jew Bite

Crescent Head - 1km north from Crescent Head

North Shore Beach - from Point Plomer to a point 3.5km north of the wall at Pelican Point.

All beaches bounded by the southern wall of Port Macquarie and Middle Rock Point

Grants Beach - from the northern wall of Camden Haven Inlet to 1km north

All beaches between Crowdy Head south to Wallabi Point

Shelly Beach - between Red Head and Diamond Beach

All beaches between the Wallis Lake entrance to the northern end of Seven Mile Beach

Boomerang Beach - entire beach

Blueys Beach - entire beach

Treachery Beach - entire beach

Bennetts Beach - 500m north and 500m south of Bennetts Beach surf club

Fingal Beach - between Fingal Beach Surf Club and 1km north along the beach.

Stockton Beach – from the sewage treatment works north to 500m north of the Signa shipwreck

Newcastle - all beaches bounded by Nobbys Head to Waste Water Treatment Works at Belmont

Moonee Beach - Deep Cave Bay – north of Flat Rocks Point or Island

Frazer Beach - Snapper Point to Wybung Head

Pebbley Beach - between Soliders Point and Norah Head

Pebby Beach (Murramarang) - entire beach

All beaches between southern extremity of Wimbie to the northern extremity of Rosedale Beach

Bengello Beach - for 500m north of Moruya Breakwall

All beaches bounded by Tarandore Point to Tuross Head

Wilson Hall Beach - for 300m on both sides of the first set of rocks south of the Lake Brou opening

All beaches bounded by Boat Harbour Point and the southern extremity of Corunna Point (Mystery Bay)

All beaches bounded by Mummaga Head (Dalmeny) south to Glasshouse Rocks (with the exception of Kianga Beach only from 1 May to 30 June each year)

All beaches bounded by Blue Point and Breakaway Beach

All beaches from the northern extremity of Armond Bay Beach to Murrah Head

All beaches bounded by Goalen Head and Bunga Head

All beaches bounded by Bengunnu Point and the northern extremity of Picnic Beach

Merimbula Beach - from the northern end south for 500m

Appendix 3 The most prominent species in the Ocean Hauling Fishery

This section provides an overview of selected target species, which constitute in excess of 90% of the total landed weight taken in the Ocean Hauling Fishery. The following descriptions of each of these species includes four graphs showing catch trends, seasonal trends, catch between other commercial fisheries and the main gear types used in harvesting each of these species.

The information in the following section has been extracted from a variety of sources including Kailola *et al*. (1993), Yearsley *et al.* (1999), Pease and Grinberg (1995), Fletcher and McVea (2000), and the NSW Fisheries Catch Statistics Database.

For a full description of the species and historic catch and effort trends, refer to NSW Fisheries' *1998/99 Status of Fisheries Resources* by Fletcher and McVea (2000), which can be found on the NSW Fisheries website: **www.fisheries.nsw.gov.au**.

Information relating to prices for the species was obtained from Sydney Fish Market records, and other marketing information was obtained from fish wholesalers or exporters in NSW.

Sea mullet *(Mugil cephalus)*

The following overview is based on information provided in SPCC (1981), Kailola *et al*. (1993), Pollard and Growns (1993), Pease and Grinberg (1995), Virgona *et al* (1998) Gibbs (1997), Yearsley *et al*. (1999), Fletcher and McVea (2000), and the NSW Fisheries catch statistics database.

The sea, bully or striped mullet (*Mugil cephalus*) occurs around much of the Australian coastline, as well as in many temperate and subtropical areas worldwide. In NSW Waters, sea mullet are found primarily within estuaries and inshore waters, although they also occur within the freshwater reaches of coastal rivers. Within estuaries, sea mullet are found in association with shallow weed beds and bare substrates. They mostly eat microscopic plants (e.g. blue-green algae, filamentous green algae and diatoms), macroalgae (e.g. the green sea lettuce *Ulva lactuca*) and detritus, and often ingest large amounts of substrate in the process.

Spawning occurs in surface waters at sea, typically during autumn to early winter. The larvae enter estuaries and the small juveniles subsequently live in sheltered shallow water habitats. Many sea mullet travel into freshwaters, where they may reside for long periods, particularly if denied passage back to the estuary. Sea mullet grow quite quickly, taking about four years to reach 440 mm in length. Maximum length is approximately 750 mm. Between late summer and early winter, adult sea mullet (two or more years of age) leave estuaries in large schools that then travel northward along the open coastline on their way to spawning grounds. This behaviour appears to be triggered by strong westerly winds and falling water temperatures. Shorter migrations by so-called 'hard-gut' (sub-adult) also occur periodically, possibly in response to heavy flooding and consequent loss of food resources.

Sea mullet are targeted in the Ocean Hauling Fishery during the annual pre-spawning run. Fish travelling in large aggregations can result in large catches from single hauls on ocean beaches. Migrations commence earlier on the south coast than on the north coast of NSW. Hence, the beach haul fishery for sea mullet commences and finishes earlier on the south coast each year. The stock is shared with the sea mullet fishery in southern Queensland.

Pre-spawning females are mainly sold directly to processors, where the roe is extracted and exported to South-East Asia. Males are sold through the Sydney Fish Market or sold direct to processors. Some males are exported whole by processors to the Middle East. Males and females are sold locally for human consumption and for bait.

When sold as whole fish through the Sydney Fish Market, sea mullet attracted an average wholesale price of $1.78/kg for the period 1995/96 to 1999/2000. Females with a high roe content (10-12% of body weight) attract the highest prices. In 1997/98 and 1998/99, processors paid $2.50 to $3.50/kg for females caught between April and July.

Annual landings progressively increased after 1984/85 and peaked at 5,560 t in 1993/94. Landings remained relatively high, between 4,000 and 5,000 t, until 1997/98. These trends reflected an increase in ocean landings, which occurred in response to the development of an export market for roe. Throughout this period, estuary landings were relatively stable. After 1997/98, landings declined significantly. This decline has been most dramatic in the ocean fishery, but estuary landings have also declined slightly. The recent decline in landings almost certainly reflects a decrease in abundance of stock, although the cause is unclear. The decline in abundance may be an effect of over harvesting by the ocean fishery, but could also be a natural fluctuation due to recruitment variability.

Sea mullet (*Mugil cephalus*)

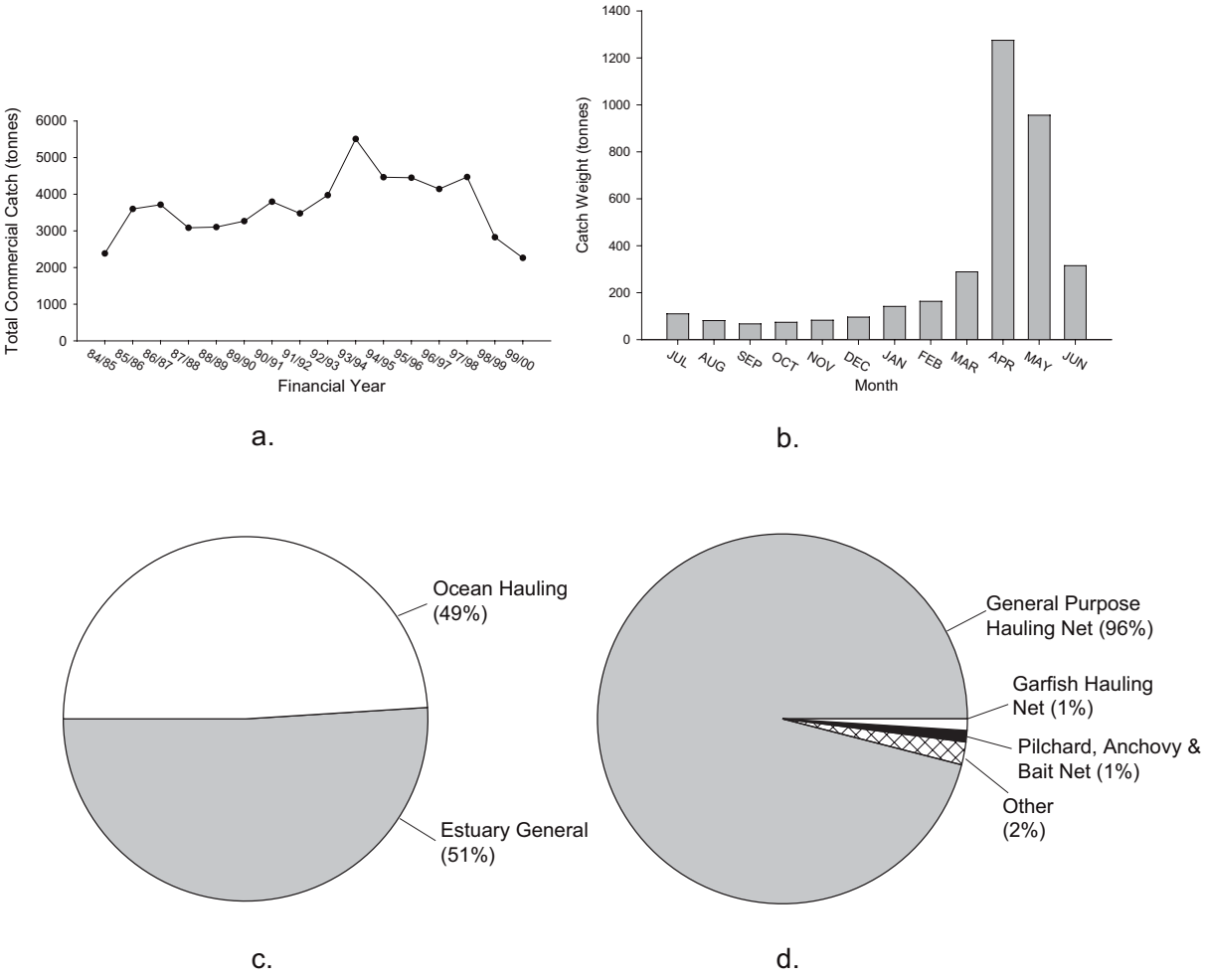

Figure 1a. The total reported commercial catch of sea mullet in NSW for the period of 1984/85 to 1999/2000.

Figure 1b. The average reported catch per month of sea mullet in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 1c. The average percentage of reported catch of sea mullet between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 1d. The average percentage of reported catch of sea mullet by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Australian salmon (*Arripis trutta*)

Eastern Australian salmon occur in continental shelf waters and in estuaries of NSW, Victoria and Tasmania. Juveniles occur in sheltered coastal waters and estuaries. Fish mature at approximately four years old and 39 cm fork length.

Australian salmon are primarily caught by haul nets in the Ocean Hauling Fishery, although small quantities are also caught by purse seining. Catches occur throughout the year. Highest annual landings have tended to occur south of Sydney.

Australian salmon have historically been targeted on the far south coast of NSW, where fish aggregate at various times of year. Fish aggregate to spawn in coastal waters between Lakes Entrance and Bermagui, from November to February. Spawning occurs in the surf zone. Fish disperse north and south after spawning. Some fish also appear to aggregate on the far south coast during winter. Fishers believe that these 'over-wintering' fish migrate northward from Victoria and Tasmania during autumn. Historically, highest catches in June on the south coast may reflect this behaviour.

More recently, since 1995, highest catches on the south coast have been in April-May and in October. This suggests that south coast fishers target fish as they migrate to i) over-wintering locations and ii) spawning locations. Since the mid-1990s, some relatively high catches have also been taken in central and northern NSW (particularly zones 4 and 5) from August to December.

In August 2001, ocean waters north of Barrenjoey Headland were closed to the commercial targeting of Australian salmon in nets. A bycatch of 100 kg of Australian salmon per person per day is in place for northern NSW waters, while the species may still be taken by net fishing south of Barrenjoey Headland. Australian salmon are predators of several important target species in the Ocean Hauling Fishery, including sea garfish and pilchards. Consequently, Australian salmon are sometimes caught when targeting these species.

When sold as whole fish through the Sydney Fish Market, Australian salmon attracted an average wholesale price of $0.97/kg for the period 1995/96 to 1999/2000. The market for Australian salmon was reduced after the closure of a south coast cannery (processing factory) in 1999. Relatively low landings in recent years probably result from reduced targeting by fishers due to a limited market, rather than a decrease in stock abundance.

NSW fishers target the same genetic stock as occurs in, and is targeted in, Victoria and Tasmania. In Victoria and Tasmania, there is an overlap in distribution between eastern and western Australian salmon – these are similar species in the same family. Australian salmon caught on the west Australian coast are the western species (*Arripis truttaceus*), which is not caught in NSW.

Australian salmon (*Arripis trutta*)

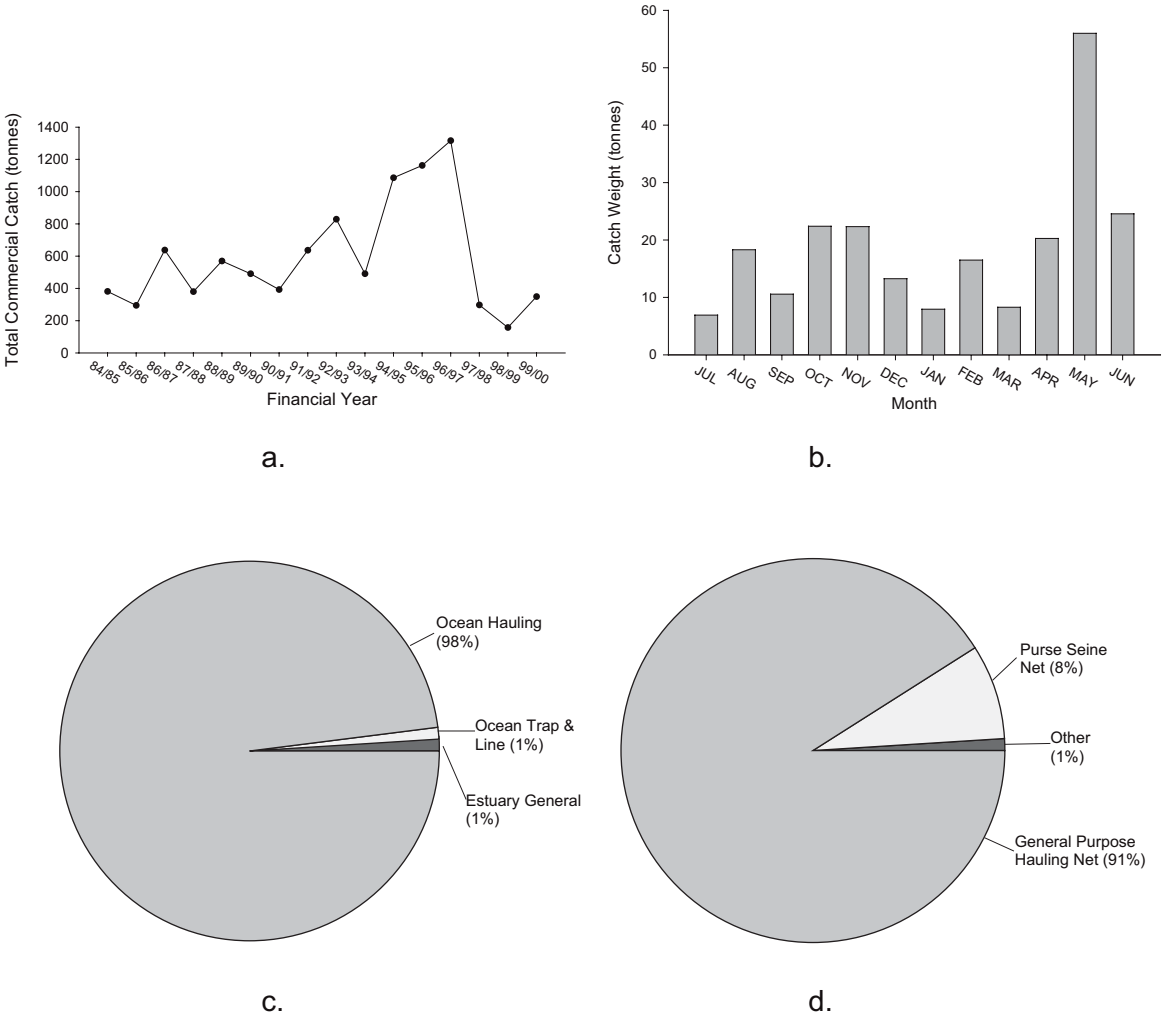

Figure 2a. The total reported commercial catch of Australian salmon in NSW for the period of 1984/85 to 1999/2000.

Figure 2b. The average reported catch per month of Australian salmon in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 2c. The average percentage of reported catch of Australian salmon between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 2d. The average percentage of reported catch of Australian salmon by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Yellowfin bream *(Acanthopagrus australis)*

The following overview is based on information provided in Pease *et al.* (1981c), Kailola *et al*. (1993), Pollard and Growns (1993), Pease and Grinberg (1995), Gibbs (1997), Yearsley *et al*. (1999), Fletcher and McVea (2000), Gray *et al*. (2000) and the NSW Fisheries catch statistics database.

The yellowfin bream (*Acanthopagrus australis*) is endemic to Australia and occurs from Townsville in Queensland to the Gippsland lakes in Victoria. In NSW Waters, yellowfin bream are found primarily within estuaries and along nearshore beaches and rocky reefs, although they also occur within the lower freshwater reaches of coastal rivers. Within estuaries, yellowfin bream are found in association with all types of habitat, including seagrass beds, mangroves, bare substrates and rocky reefs. They eat a wide variety of foods, including small fish, molluscs, crustaceans and worms.

Spawning occurs in surf zones near estuary entrances, typically during winter. The larvae enter estuaries and the small juveniles subsequently live in sheltered shallow water habitats (particularly seagrass beds and mangrove channels). Larger juveniles occur in slightly deeper waters, and are particularly common around estuarine reefs. Yellowfin bream grow slowly, taking about five years to reach 230 mm (fork length). They mature at around 220 mm and appear to undertake extensive pre-spawning migrations. Maximum length is about 660 mm (total length). Adults usually return to estuarine waters after spawning.

The majority of bream taken in the Ocean Hauling Fishery are caught in general purpose hauling nets. The highest commercial catches of bream occur in autumn and winter. Yellowfin bream are also taken in large quantities by recreational fishers.

Reported landings of bream have declined over the past seven years. Reductions in the past three years may be partly attributed to phasing out of the use of pound nets in Port Stephens and adjoining coastal waters but could also be attributable to general declines in reported estuarine fishing effort. Declines in landings could also be attributed to environmental conditions and the availability of fish in the Ocean Hauling Fishery. Despite the recent reductions in reported landings, the age compositions of catches have remained relatively stable, indicating no declines in older fish. The absence of a reliable index of stock abundance casts much uncertainty over the status of the bream stock.

Bream are a popular table fish with the majority sold fresh on the domestic market. When sold as whole fish through the Sydney Fish Market, bream attracted an average wholesale price of $8.68/kg for the period 1995/96 to 1999/2000. Yellowfin bream should not be confused with morwong, which are often sold under the marketing name of ‘bream’ or ‘sea bream’.

Black bream are a similar species to yellowfin bream and are found in estuarine waters on the NSW coast south of Myall Lakes. They are almost exclusively found in estuarine waters, and generally only enter ocean waters after periods of flood. Black bream are often reported as yellowfin bream during catch reporting as distinguishing the difference between the species by visual examination can be very difficult. The differentiation between the species is made more difficult through a percentage of hybrids that exist as a result of the two species interbreeding. Black bream only constitute a small component (less than 5%) of overall estuarine bream catches.

The species of black and yellowfin bream are required to be recorded under the same species on monthly catch returns. The presence of black bream in ocean hauling landings is very rare and landings of black bream by ocean hauling fishers are considered to be nil.

Yellowfin bream *(Acanthopagrus australis)*

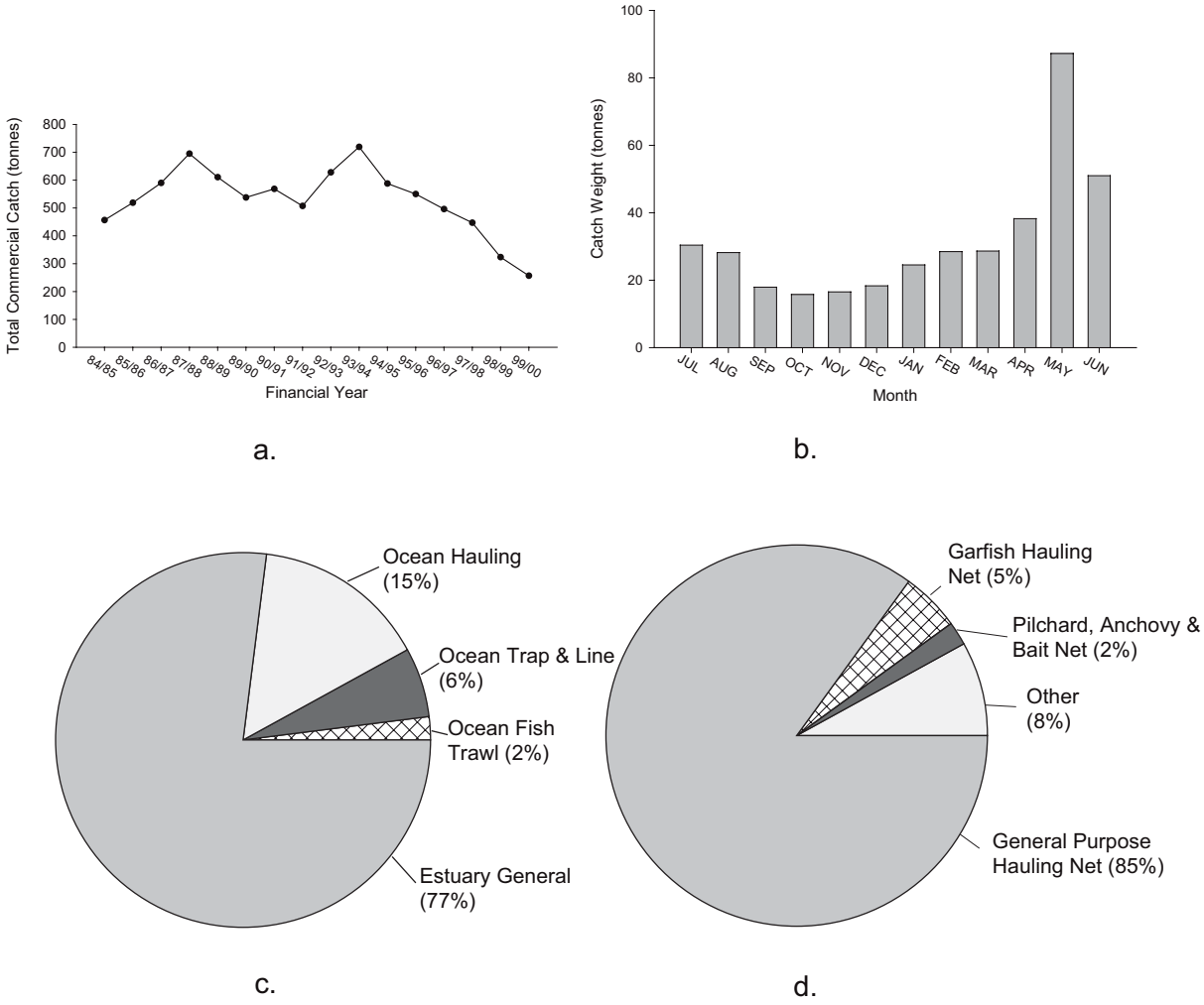

Figure 3a. The total reported commercial catch of bream (black and yellowfin) in NSW for the period of 1984/85 to 1999/2000.

Figure 3b. The average reported catch per month of bream (black and yellowfin) in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 3c. The average percentage of reported catch of bream (black and yellowfin) between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 3d. The average percentage of reported catch of bream (black and yellowfin) by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Sea garfish *(Hyporhamphus australis)*

Sea garfish are found in ocean waters of Queensland, NSW and Victoria, and also Lord Howe and Norfolk Islands. They are also found in the lower reaches of estuaries. The life history is poorly understood. Juveniles are known to occur in estuaries and spawning most likely occurs in coastal waters.

In NSW, virtually all sea garfish are caught by the Ocean Hauling Fishery during summer and autumn. Most catches are in hauling nets, with small quantities caught in bullringing nets.

Historically, the largest catches have been made by boat-based hauling to the south of Sydney, while smaller catches from beach-based hauling occurred to the north. In recent years, northern landings (particularly around Port Stephens) have increased due to an increase in boat-based activities. Boats are a more efficient method by which to target garfish.

In general, marked increases in annual landings of sea garfish were associated with the development of an export market to Japan during the early 1990s. A significant decline in NSW landings since the mid-1990s has prompted concerns that this stock is overfished. Sea garfish catch-per-unit-effort by beach and boat-based fishers decreased over this period, strongly suggesting a decline in stock abundance.

When sold as whole fish through the Sydney Fish Market, sea garfish attracted an average wholesale price of $4.06/kg for the period 1995/96 to 1999/2000. The highest returns are attained for garfish that are sold directly to processors for export. Only large fish are exported. Large and medium sized fish are sold for local consumption, and small fish are also used locally for bait.

Sea garfish (*Hyporhamphus australis*)

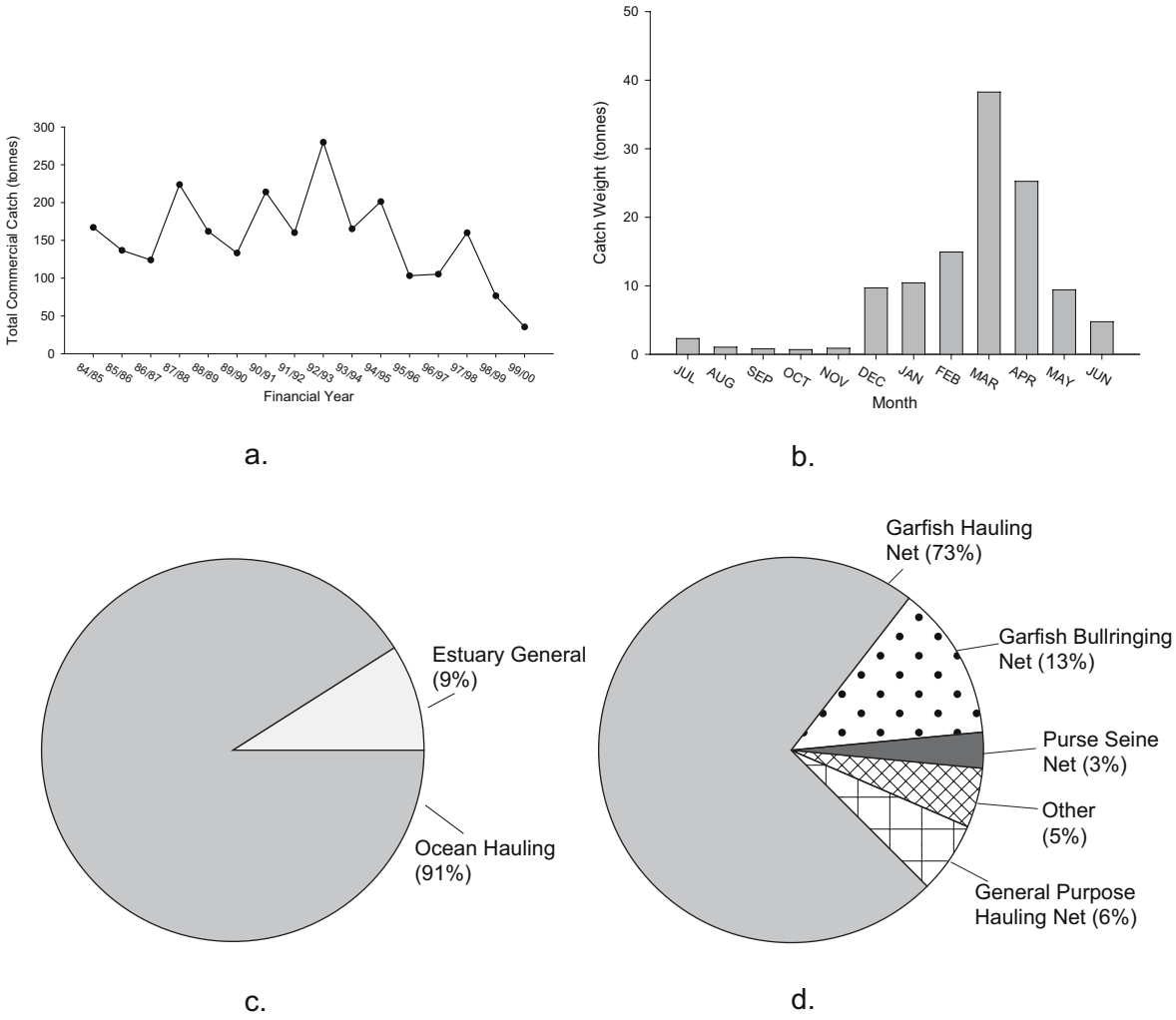

Figure 4a. The total reported commercial catch of sea garfish in NSW for the period of 1984/85 to 1999/2000.

Figure 4b. The average reported catch per month of sea garfish in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 4c. The average percentage of reported catch of sea garfish between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 4d. The average percentage of reported catch of sea garfish by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Luderick *(Girella tricuspidata)*

The following overview is based on information provided in Pease *et al*. (1981c), Kailola *et al*. (1993), Pollard and Growns (1993), Pease and Grinberg (1995), Gibbs (1997), Yearsley *et al*. (1999), Fletcher and McVea (2000), and the NSW Fisheries catch statistics database.

The luderick (*Girella tricuspidata*) occurs from Noosa in Queensland to Tasmania and South Australia and is also found in New Zealand. In NSW Waters, luderick are found primarily within estuaries and around nearshore rocky reefs. Within estuaries, luderick are mainly found in association with 'weedy' habitats such as seagrass beds and rocky reefs. They are primarily herbivorous, preferring certain species of green macroalgae; although other foods (particularly small invertebrates) also form part of their diet.

Spawning occurs in surf zones near estuary entrances, typically during winter. The larvae enter estuaries and the small juveniles subsequently live in sheltered shallow water habitats (particularly seagrass beds and mangrove channels). Larger juveniles occur in slightly deeper waters, and are particularly common around estuarine reefs. Luderick grow fairly slowly, taking approximately five years to reach 270 mm (fork length). They mature at around 250 mm and undertake a northerly migration along the NSW coast prior to spawning. Maximum length is approximately 700 mm (total length). Adults usually return to estuarine waters after spawning.

Luderick taken in the Ocean Hauling Fishery are caught in general purpose hauling nets. The highest commercial catches of luderick occur in autumn and winter.

When sold as whole fish through the Sydney Fish Market, luderick attracted an average wholesale price of $1.42/kg for the period 1995/96 to 1999/2000. A higher price is generally obtained in the Melbourne Fish Market, so many fishers on the south coast send luderick to markets in Melbourne rather than Sydney. A proportion of luderick is salted and used for bait in the commercial rock lobster fishery, although estimates are not recorded.

Luderick (*Girella tricuspidata*)

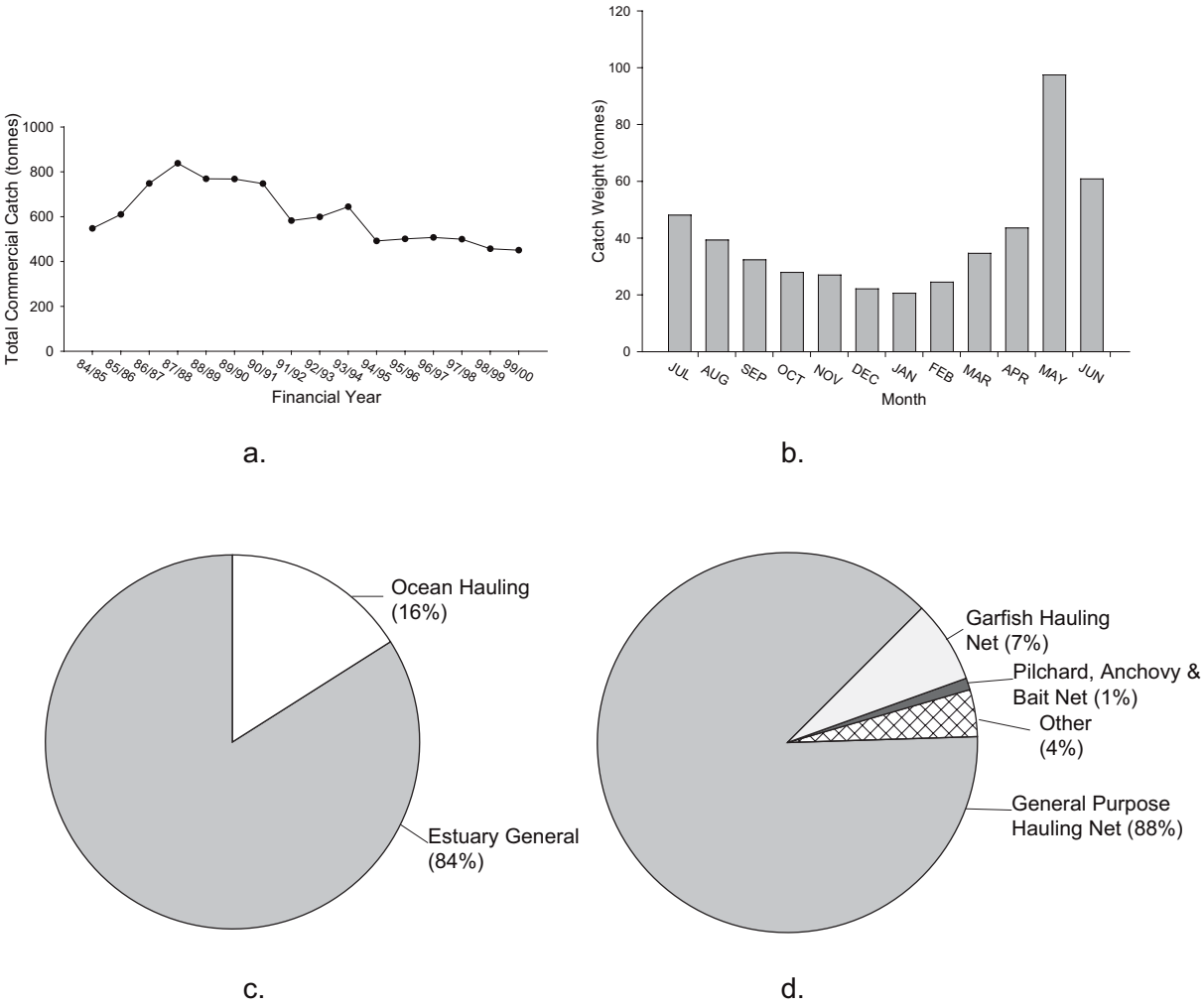

Figure 5a. The total reported commercial catch of luderick in NSW for the period of 1984/85 to 1999/2000.

Figure 5b. The average reported catch per month of luderick in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 5c. The average percentage of reported catch of luderick between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 5d. The average percentage of reported catch of luderick by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Sand whiting (*Sillago ciliata*)

The following overview is based on information provided in Pease *et al*. (1981b), Hutchins and Swainston (1986), Kailola *et al*. (1993), Pollard and Growns (1993), West (1993) Pease and Grinberg (1995), Gibbs (1997), Yearsley *et al*. (1999), Fletcher and McVea (2000), and the NSW Fisheries catch statistics database.

The sand whiting (*Sillago ciliata*) occurs along the entire eastern coastline of Australia, from Cape York (Queensland) down to eastern Tasmania. It is also found in New Caledonia and Papua New Guinea. In NSW waters, sand whiting are found within estuaries and in coastal waters off ocean beaches. Within estuaries, the favoured habitat is bare sandy substrate. Sand whiting eat bottom-dwelling invertebrates, particularly polychaete worms, crustaceans and molluscs taken by fossicking though the sand.

Spawning occurs near river mouths, typically during summer. Many of the larvae enter estuaries, with the small juveniles preferring shallow water (particularly along sandy shores, but also in and around seagrasses and mangroves). Sand whiting grow fairly slowly, taking about five years to reach 290 mm (fork length). They mature at around 240 mm (males) to 260 mm (females). Maximum length is about 500 mm (total length). After spawning, adults may either enter estuarine waters or remain along ocean beaches.

Sand whiting are caught by ocean haul fishers when they move out of estuaries to spawn at estuary mouths and in surf zones. Catches by Ocean Hauling Fishery are low relatively to catches by estuary general fishers.

The majority of sand whiting taken by the Ocean Hauling Fishery are caught in general purpose hauling nets throughout the year but catches are higher in summer and autumn. When sold as whole fish through the Sydney Fish Market, sand whiting attracted an average wholesale price of $9.27/kg for the period 1995/96 to 1999/2000.

The average total catch of sand whiting in the Ocean Hauling Fishery for the years 1997/98 and 1998/99, was 8,231 kg.

Sand whiting (*Sillago ciliata*)

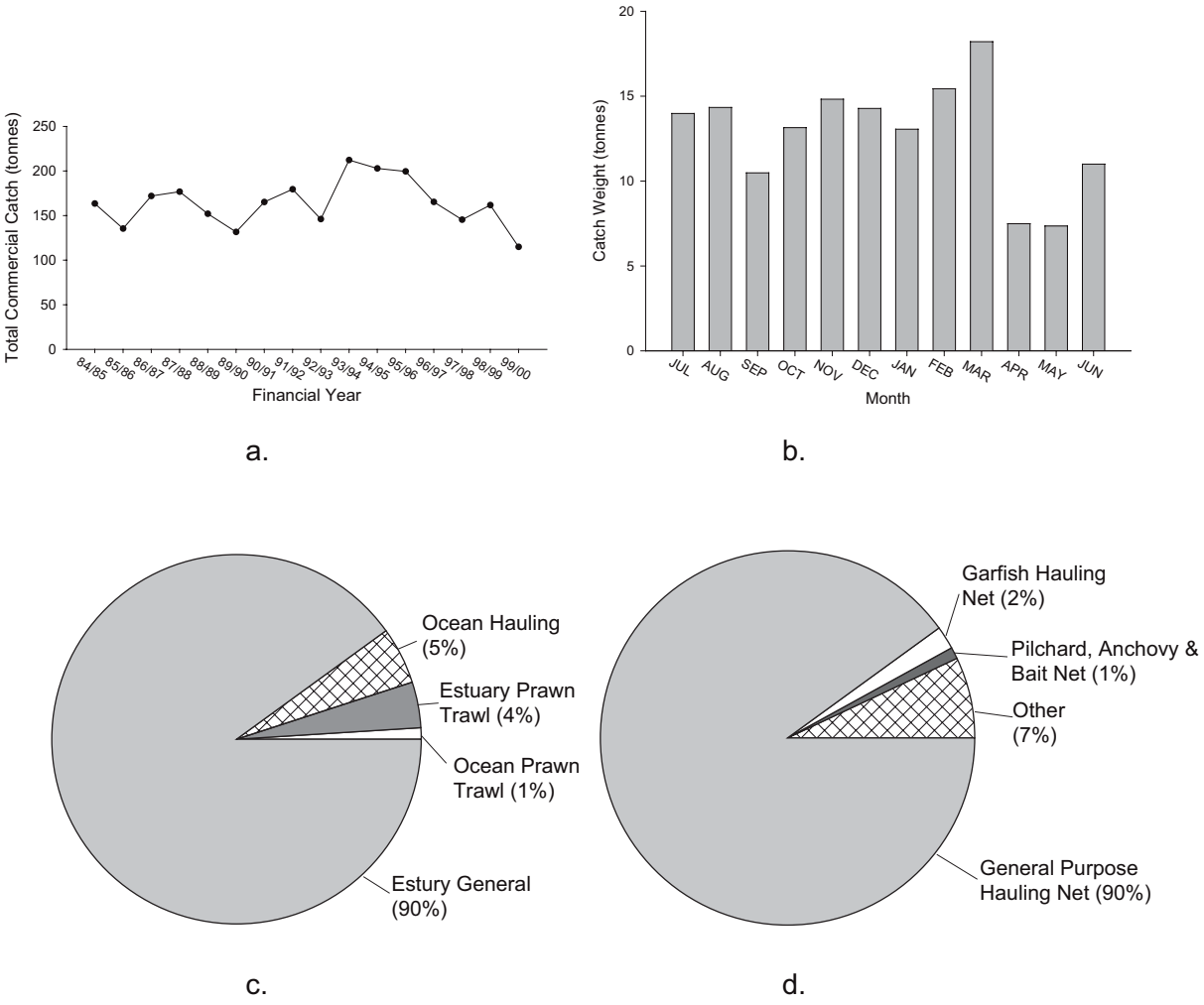

Figure 6a. The total reported commercial catch of sand whiting in NSW for the period of 1984/85 to 1999/2000.

Figure 6b. The average reported catch per month of sand whiting in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 6c. The average percentage of reported catch of sand whiting between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 6d. The average percentage of reported catch of sand whiting by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Pilchards (*Sardinops neopilchardus*)

Pilchards occur in many temperate regions of the world, including all states of Australia except the Northern Territory. Pilchards inhabit continental shelf waters and the lower reaches of estuaries. Spawning occurs in summer and autumn in NSW waters. Fish mature at one to three years old and 7-13 cm fork length.

Pilchards are mainly caught by the Ocean Hauling Fishery in purse seine nets and bait nets (which are modified hauling nets). Catches of pilchards by lift nets for bait were 4,570kg in the 1999/2000 financial year. Smaller quantities are also taken in general purpose hauling nets. Highest catches occur in winter and spring in this fishery, although some catches are taken throughout the year.

Mass mortality of pilchards occurred in 1995 and 1998 throughout Western Australia, South Australia, Victoria and NSW, apparently caused by a herpes virus. Closures were put in place during these periods preventing commercial catches of pilchards, contributing to the lower level of catch taken in these years. Very low annual landings since these events suggest that stock levels are yet to recover.

Pilchards are sold for bait, pet food and for human consumption, either canned or fresh. Pilchards are an important prey item for many fish, including other target species in the Ocean Hauling Fishery. When sold as whole fish through the Sydney Fish Market, pilchards attracted an average wholesale price of $2.46 per kilogram for the period 1995/96 to 1999/2000.

The average total catch of pilchards in the fishery for the years 1997/98 and 1998/99, was 239, 639 kg.

Pilchards *(Sardinops neopilchardus)*

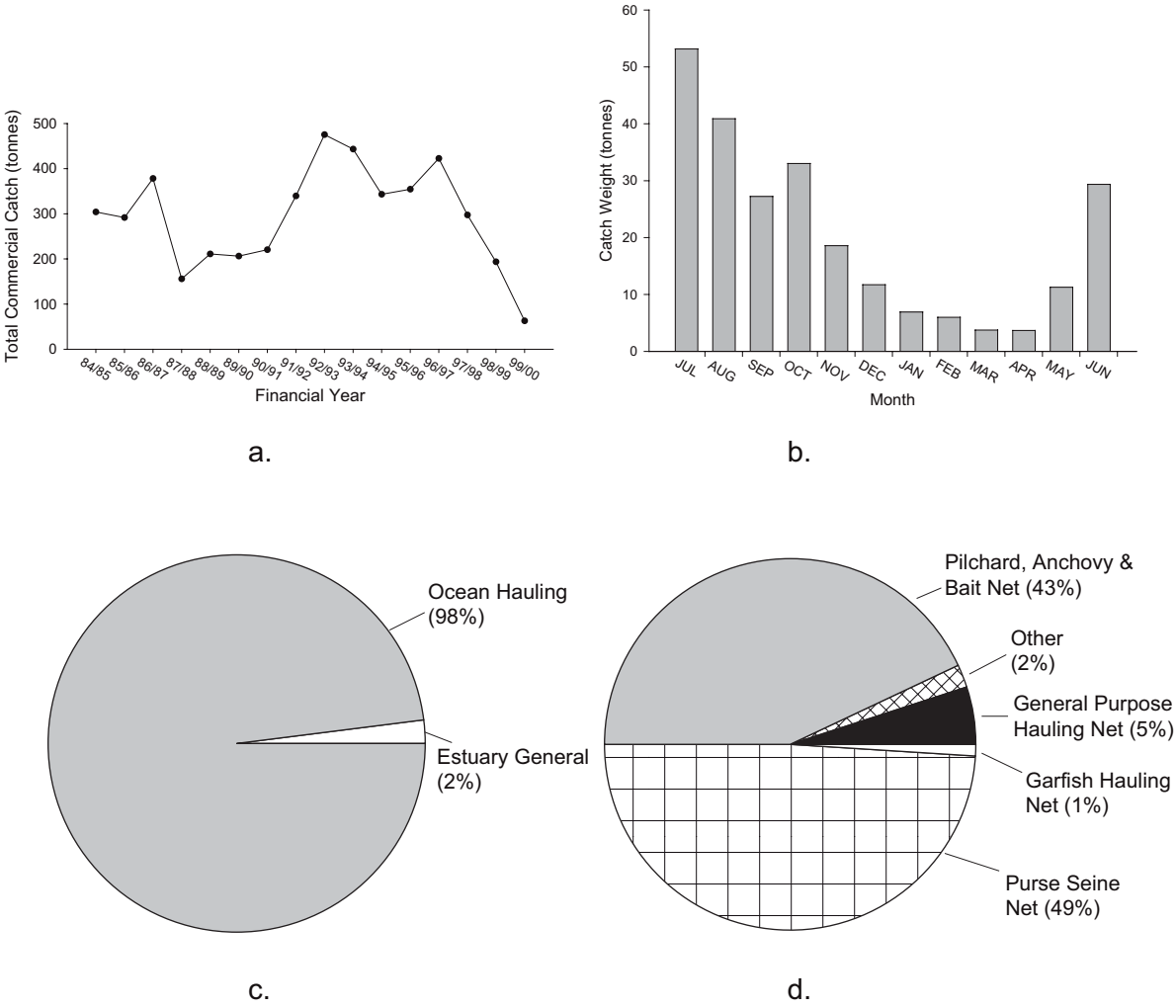

Figure 7a. The total reported commercial catch of pilchards in NSW for the period of 1984/85 to 1999/2000.

Figure 7b. The average reported catch per month of pilchards in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 7c. The average percentage of reported catch of pilchards between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 7d. The average percentage of reported catch of pilchards by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Yellowtail *(Trachurus novaezelandiae)*

Yellowtail occur in all States of Australia except the Northern Territory. The species inhabits coastal waters and the lower reaches of estuaries. Adults are associated with rocky reefs, while juveniles occur over shallow, soft substrate. Spawning occurs in summer and autumn in NSW waters. Fish mature at approximately three years old and 20-22 cm fork length.

Yellowtail are relative long lived, reaching 28 years in New Zealand, and at least 15 years in NSW. The Ocean Hauling Fishery may exploit relatively young fish. Fish from the NSW stock also occur offshore, beyond state waters, and may be targeted by Commonwealth licensed purse seine fishers.

Yellowtail are mainly caught by the Ocean Hauling Fishery in purse seine nets. Smaller quantities are also taken in bait nets (which are modified hauling nets) and general purpose hauling nets. Catches are taken throughout the year, with slightly higher catches in summer and autumn. Catches of yellowtail by lifts net for bait were 14,011 kg and 18,738 kg in 1997/1998 and 1998/1999, respectively.

The trend of increasing catches is probably a result of a growing demand for the yellowtail for use as bait in other commercial and recreational fishing activities, predominantly fishing for tuna. The trend may also partly reflect recent improvements in the reporting of baitfish landings. Bait caught for own use may not have been fully reported in earlier years.

Most yellowtail are sold for human consumption or for bait. When sold as whole fish through the Sydney Fish Market, yellowtail attracted an average wholesale price of $1.43 / kilogram for the period 1995/96 to 1999/2000.

Yellowtail *(Trachurus novaezelandiae)*

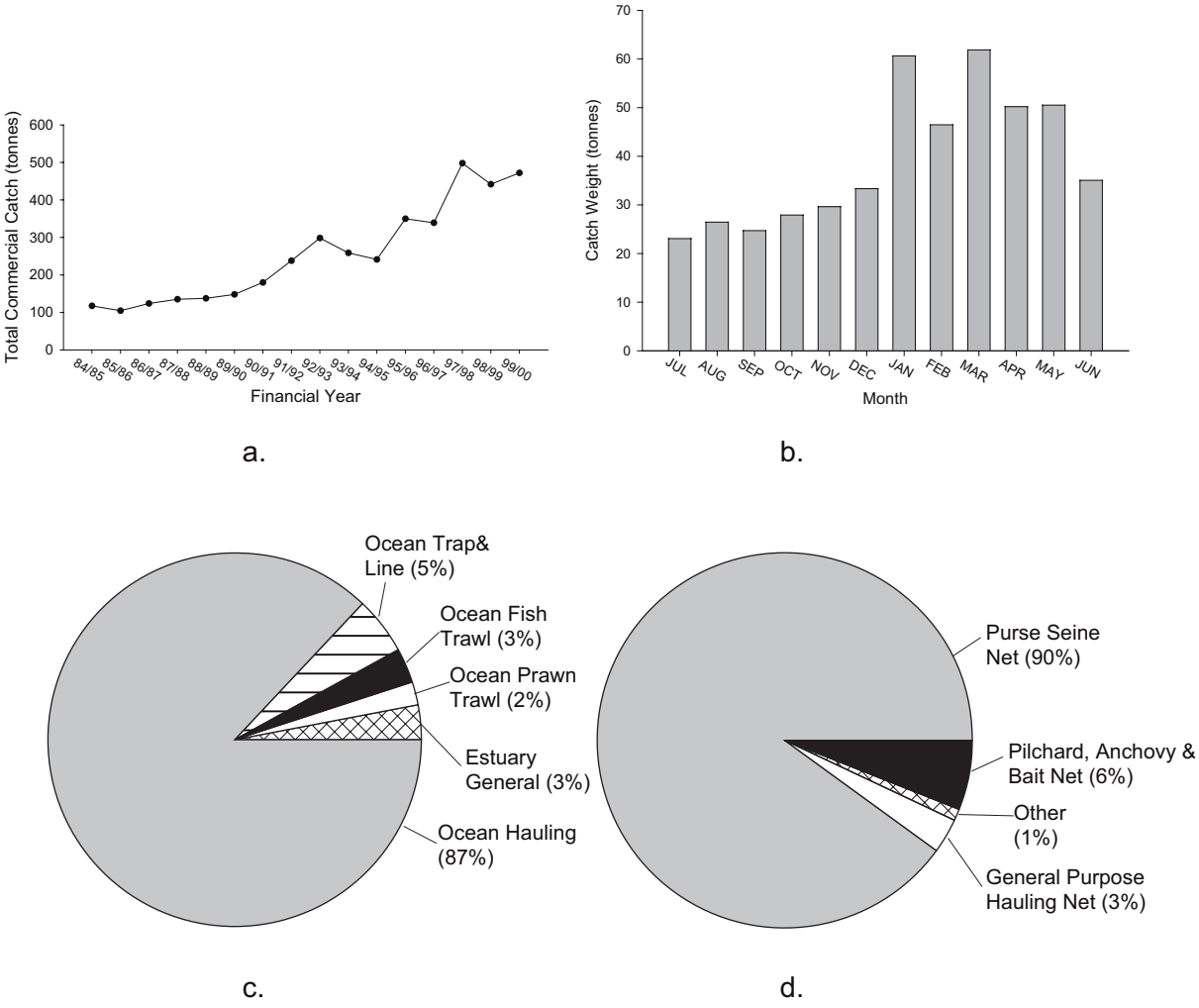

Figure 8a. The total reported commercial catch of yellowtail in NSW for the period of 1984/85 to 1999/2000.

Figure 8b. The average reported catch per month of yellowtail in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 8c. The average percentage of reported catch of yellowtail between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 8d. The average percentage of reported catch of yellowtail by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Blue mackerel *(Scomber australasicus)*

Blue mackerel occur in all states of Australia except the Northern Territory. The species inhabits estuarine and continental shelf waters, with older fish occurring further offshore. Spawning occurs in summer. The life history is poorly understood.

Blue mackerel grow relatively quickly, reaching approximately 25 cm after one year. The Ocean Hauling Fishery exploits relatively young fish. The oldest fish from the NSW stock occur offshore, beyond state waters, and are probably targeted by Commonwealth licensed purse seine fishers.

Blue mackerel are mainly caught by the Ocean Hauling Fishery in purse seine nets. Smaller quantities are also taken in bait nets (which are modified hauling nets) and general purpose hauling nets. Similar catch levels occur in all months of the year. Catches of blue mackerel by lift nets for bait were 10,926 kg and 9,833 kg in 1997/1998 and 1998/1999 (respectively).

The long term catch trend for blue mackerel is stable, although considerable fluctuations have occurred. These fluctuations are likely to reflect changes in stock availability due to recruitment variability, and may also reflect changes in the distribution of fish due to oceanographic factors.

Most blue mackerel are sold for human consumption or for bait. When sold as whole fish through the Sydney Fish Market, blue mackerel attracted an average wholesale price of $1.44 per kilogram for the period 1995/96 to 1999/2000.

Blue mackerel *(Scomber australasicus)*

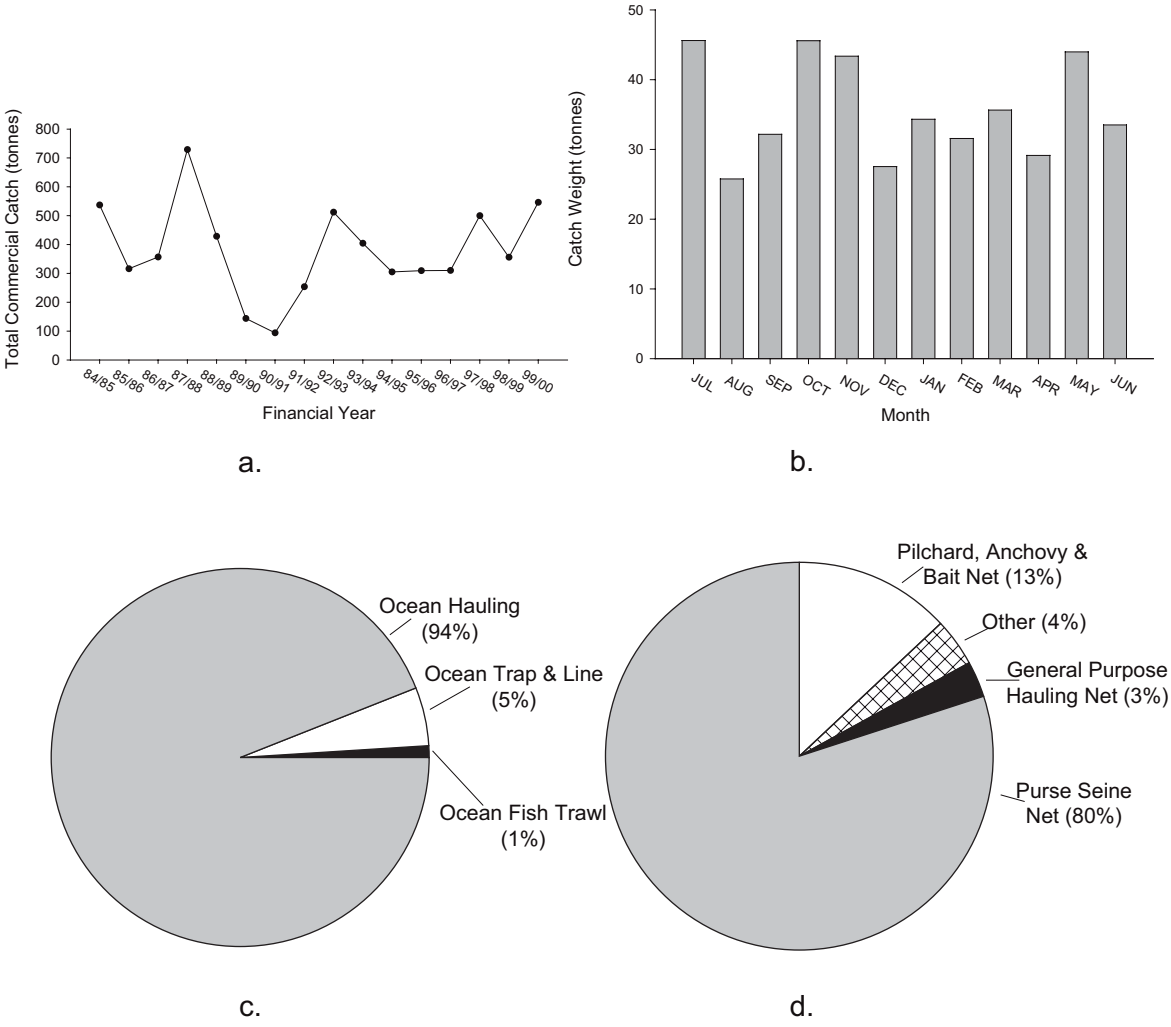

Figure 9a. The total reported commercial catch of blue mackerel in NSW for the period of 1984/85 to 1999/2000.

Figure 9b. The average reported catch per month of blue mackerel in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 9c. The average percentage of reported catch of blue mackerel between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 9d. The average percentage of reported catch of blue mackerel by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Sweep *(Scorpis lineolatus)*

Silver sweep are most abundant in NSW waters but also occur in southern Queensland, Victoria and Tasmania. Adults and juveniles are associated with coastal and estuarine reefs. The biology of this species is poorly understood. Spawning times and locations are unknown. The age and size at maturity is also unknown. Sweep are relatively long-lived and may reach a maximum age over 40 years (D. Ferrell, NSW Fisheries, unpubl. data). Preliminary evidence suggests that the average age of sweep caught by recreational fishers is approximately 25 years. The longevity and slow growth of this species may make it particularly vulnerable to over-harvesting.

In NSW, approximately two thirds of sweep commercial landings are by fish traps within the Ocean Trap and Line Fishery, with the remaining catch taken by purse seine nets within the Ocean Hauling Fishery. Trap landings are highest during spring and summer months, whereas purse seine landings tend to be higher during autumn.

Between 1990/91 and 1992/93, reported landings of this species increased from about 70 t to 150 t. Peak landings of 157 t occurred in 1995/96. Between 1997/98 and 1990/2000, reported landings declined rapidly from 143 t to 48 t. Preliminary data suggests that this decline continued in 2000/01, with unverified commercial landings of approximately 27 t. Such significant fluctuations in landings are of concern, given the minimal information regarding stock structure and general life history that is available for this species.

When sold as whole fish through the Sydney Fish Market, sweep attracted an average wholesale price of $1.91/kg for the period 1995/96 to 1999/2000. Price increased steadily over this period and averaged $2.71 in 1999/00. Sweep is a relatively new product for human consumption in NSW, and price is expected to continue to increase as markets develop.

Other species of sweep, which are common to the north and south of NSW but also occasionally occur within NSW, may form part of commercial sweep landings in NSW. However, the extent to which this occurs is unclear.

The average total catch of sweep in the fishery for the years 1997/98 and 1998/99, was 40,717 kg.

Sweep *(Scorpis lineolatus)*

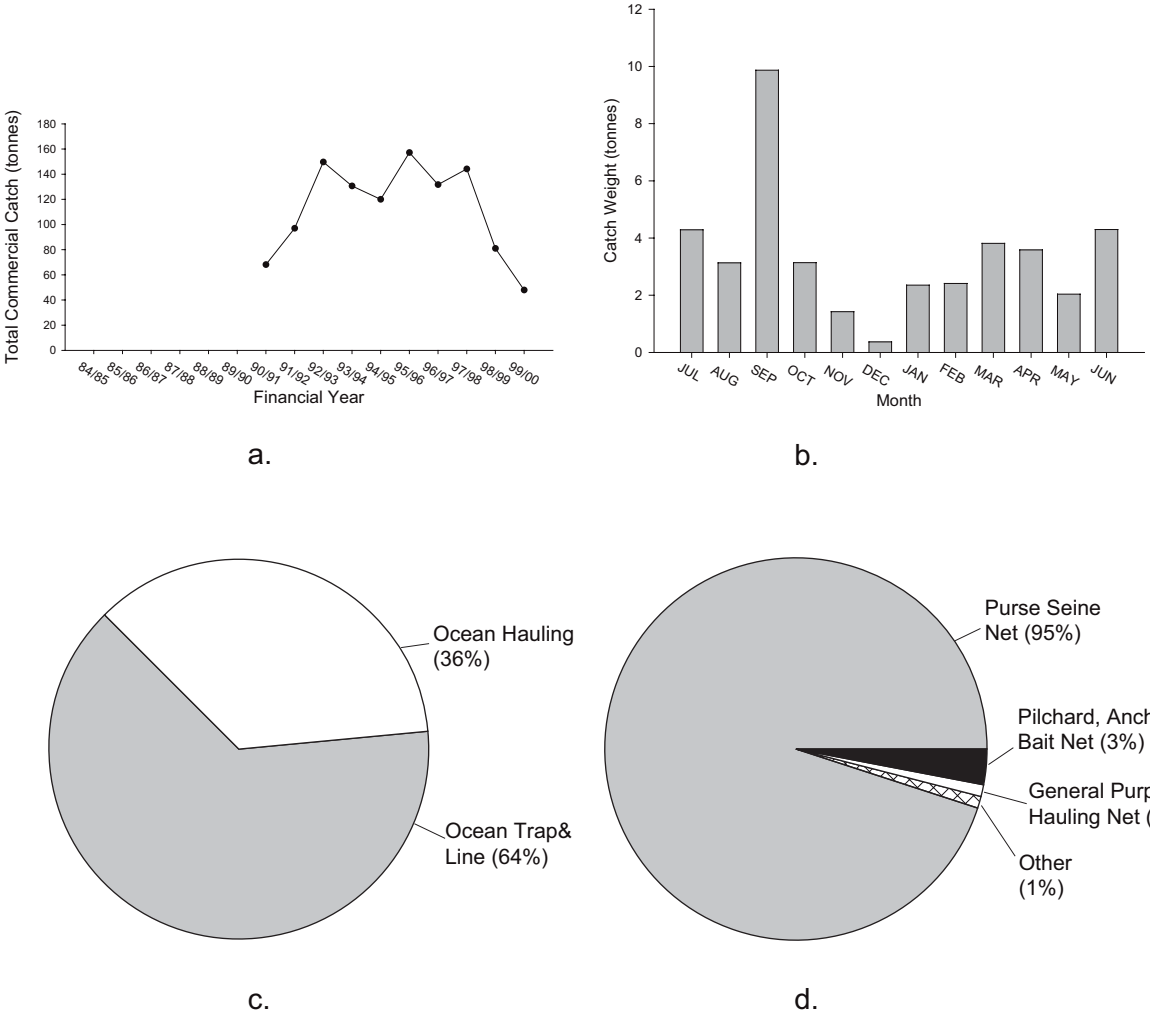

Figure 10a. The total reported commercial catch of sweep in NSW for the period of 1984/85 to 1999/2000 (**Note:** sweep were not recorded on commercial catch returns prior to 1990).

Figure 10b. The average reported catch per month of sweep in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 10c. The average percentage of reported catch of sweep between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 10d. The average percentage of reported catch of sweep by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.

Silver trevally (*Pseudocaranx dentex*)

The following overview is based on information provided in Pease *et al*. (1981b), Kailola *et al*. (1993), Fletcher and McVea (2000), Neira *et al.* (1998), Rowling and Raines (2000), and the NSW Fisheries catch statistics database.

Silver trevally (*Pseudocaranx dentex*) occur in estuarine and coastal waters of all Australian states, and around northern New Zealand. Most of the Australian catch is taken in NSW and eastern Victoria. It is possible that catches from waters west of Bass Strait are comprised mainly of a different (but almost identical) species (*Pseudocaranx wrighti*). Silver trevally is a schooling species, which inhabits mainly sandy substrates. They feed on benthic invertebrates, including worms and molluscs, and also on benthic and planktonic crustaceans.

Female silver trevally have moderate fecundity (50,000–200,000 eggs) and spawn during an extended period from spring to autumn. Larvae occur in coastal waters throughout this period, and may enter estuaries before settling out as juveniles. Fish less than 10 cm in length were found in samples from Botany Bay between December and August, however the life history of juvenile trevally is poorly known. Maturation occurs between 18 and 25 cm in length. Although mature fish occur most often in ocean waters, they do enter estuaries at certain times.

Silver trevally is a relatively long lived, slow growing species, attaining a maximum age in excess of 25 years. In NSW coastal waters trevally reach a maximum size of about 65 cm fork length and weight of about 4 kg. Since the 1980s, the average size of silver trevally in catches has declined considerably and in recent years fish greater than about 35 cm in length (or 0.75 kg in weight) have been very poorly represented in catches. Commercial catches are dominated by young fish, less than about five years of age.

In estuarine waters, the main commercial catches of trevally are taken in the late summer and early autumn. The bulk of the catch is taken by haul nets in the large estuaries in the Sydney area. Significant catches of trevally are also taken by commercial fish trawl and trap fishers in ocean waters, and the species is very popular amongst recreational fishers in both estuarine and ocean waters. In the mid 1990s the annual catch of silver trevally from ocean waters by recreational fishers was estimated to be at least 130 tonnes.

There has been a significant decline in commercial landings of silver trevally since the mid 1980s, from about 1000 t per annum to around 300 t per annum. Most trevally are sold fresh at the Sydney and Melbourne fish markets where the species receives moderate prices ($1.50 – $2.50 per kg) depending on the quality of handling after capture. High quality ‘ice slurried’ trevally are also exported, receiving higher prices ($3.50 - $5.00 per kg).

Silver trevally *(Pseudocaranx dentex)*

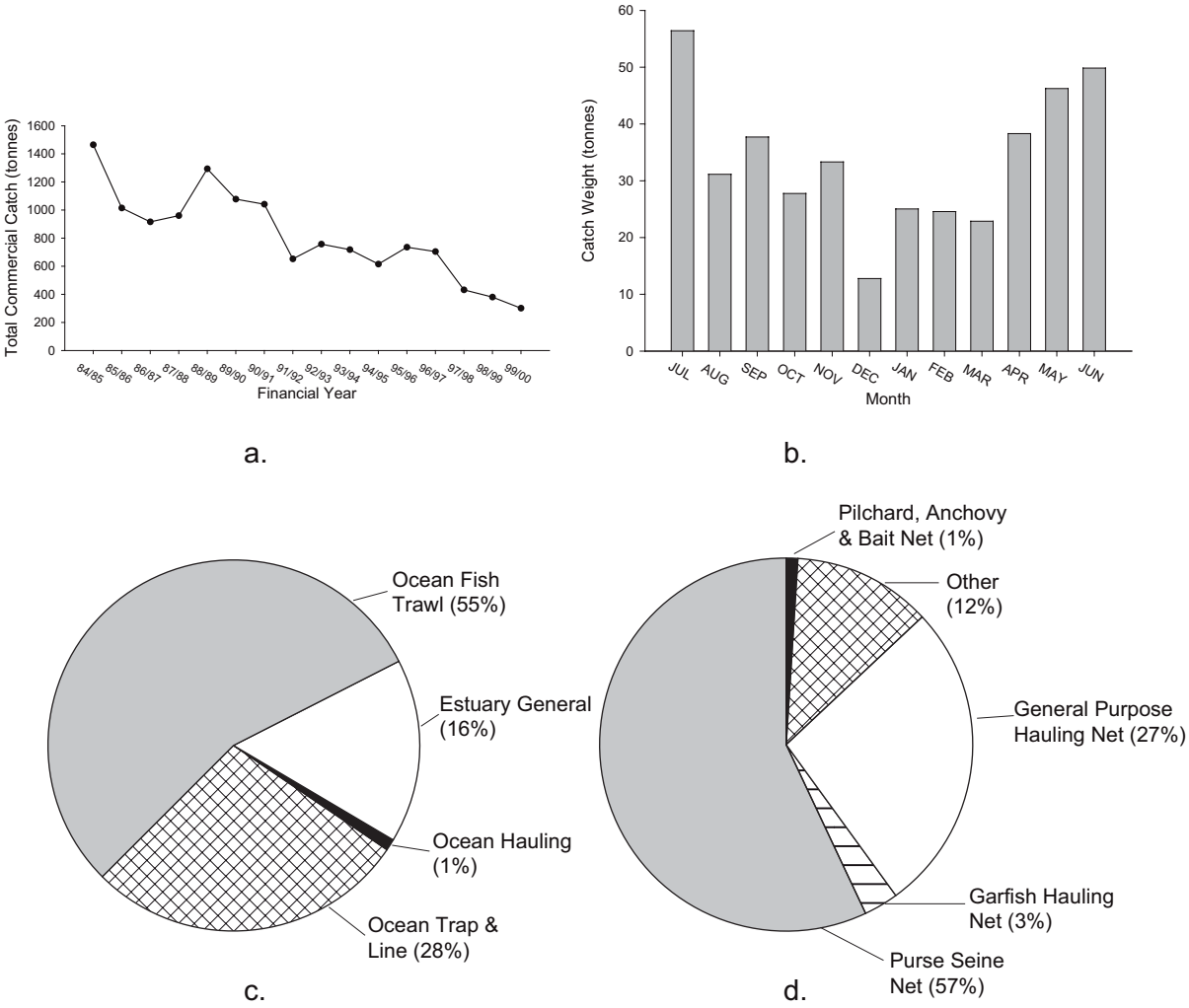

Figure 11a. The total reported commercial catch of silver trevally in NSW for the period of 1984/85 to 1999/2000.

Figure 11b. The average reported catch per month of silver trevally in the Ocean Hauling Fishery for the period of 1997/98 and 1998/99.

Figure 11c. The average percentage of reported catch of silver trevally between commercial fisheries for the period of 1997/98 and 1998/99.

Figure 11d. The average percentage of reported catch of silver trevally by gear types in the Ocean Hauling Fishery for the period 1997/98 and 1998/99.