

Fishery Management Strategy

for the

NSW Lobster Fishery

February 2007



**NSW DEPARTMENT OF
PRIMARY INDUSTRIES**



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PRIMARY INDUSTRIES

Fishery Management Strategy for the NSW Lobster Fishery

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The Fishery Management Strategy for the Lobster Fishery will be updated from time to time. Amendments will be made available on the NSW DPI website:

<http://www.dpi.nsw.gov.au/fisheries>

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Abbreviations

ARC	Australian Research Council
CL	Carapace length
DEH	Department of the Environment and Heritage (Commonwealth)
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESD	Ecologically sustainable development
FM	Fisheries management
FM Act	<i>Fisheries Management Act 1994</i>
FMS	Fishery management strategy
FRDC	Fisheries Research and Development Corporation
IFS	Indigenous Fisheries Strategy
LFB	Licensed fishing boat
LobMAC	Lobster Management Advisory Committee
MAC	Management Advisory Committee
MLL	Minimum legal length
nm	Nautical miles
NSW	New South Wales
NSW DPI	NSW Department of Primary Industries
OCS	Offshore Constitutional Settlement
SMP	Share management plan
TAC	Total allowable catch
TACC	Total allowable commercial catch

1. Introduction to the Lobster Fishery

1.1 Background to the Fishery Management Strategy

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 (FMS) for each major commercial fishery, fish stocking and for the beach safety program. They also require an assessment of the environmental impacts of those fishing activities.

The FMS for the Lobster Fishery is much more than a collection of rules for the fishery. The strategy contains the vision, goals and objectives for the fishery, a broad description of the way the fishery operates, and outlines the future management framework. It also outlines a program for monitoring the performance of the fishery against the management goals. Where necessary, information about the impacts of harvesting by other fishing sectors (such as recreational fishing) is also provided, however the rules contained in this FMS apply only to the Lobster Fishery. The rules applying to other commercial and non-commercial fishing sectors are separate management arrangements and are not the subject of this strategy.

The Lobster Management Advisory Committee (LobMAC) provided significant input into the drafting of this strategy. Input into the draft strategy was also sought from the Ministerial advisory councils on the seafood industry and recreational fishing, and the Fishery Management Strategy Working Group. Government agencies, such as the NSW Department of Planning and the Commonwealth Department of the Environment and Heritage, have also been consulted throughout the drafting of the FMS.

An Environmental Impact Statement (EIS) was prepared for the Lobster Fishery and publicly exhibited in December 2004/January 2005. The EIS contained the draft FMS and an assessment of the environmental risk mitigation measures contained therein. The structure of the EIS was based on guidelines issued by the NSW Department of Planning (formerly Planning NSW), including an assessment of the biophysical, social and economic impacts of implementing the draft FMS.

The EIS highlighted the importance of the Lobster Fishery to the community in terms of employment, supply of seafood to the community and economic benefits. The EIS concluded that, although there were several existing environmental risks, the management controls proposed by the draft FMS provided for an appropriate allocation of the resource and incorporated the measures needed to address the various principles of ecologically sustainable development.

After considering the EIS (among other things), the NSW Minister for Primary Industries made a formal determination under the *Environmental Planning and Assessment Act 1979* on 1 March 2006 with respect to the Lobster Fishery (see Appendix 1). The determination permits the fishery to continue subject to the draft FMS being modified to take account of the preferred strategies developed after the EIS public exhibition phase. The FMS presented below incorporates those changes and has since been approved by the Minister under the provisions of the *Fisheries Management Act 1994*.

The requirement for the Government to assess the environmental impacts of each individual Lobster Fishery authority upon its issue or renewal no longer applies.

1.2 The Lobster Fishery

The Lobster Fishery is one of eight major marine and estuarine based commercial fisheries in New South Wales. It is a quota managed fishery which targets the eastern rock lobster (*Jasus verreauxi*). It is a specialised fishery that takes what is considered a premier seafood species for local consumption and export.

The Lobster Fishery is the only fishery in NSW that is allowed to take rock lobster species. Small quantities of other species are also retained in the fishery. Lobsters are taken primarily by traps set in ocean waters. Lobsters may be gathered by hand, however, the use of artificial breathing apparatus is prohibited.

There is a variation in the levels of participation of fishers in the Lobster Fishery. Some fishers operate on a full time basis, whereas for others, lobster fishing is one component of their fishing business and therefore participation in the Lobster Fishery may be on a part-time or seasonal basis. Table 1.1 shows the relationship between the Lobster Fishery and other commercial fisheries in NSW.

1.3 Vision and Goals of the NSW Lobster Fishery

1.3.1 Fishery Vision

The vision for the NSW Lobster Fishery is:

A lobster fishery that is ecologically sustainable and profitable and that works to improve the understanding and management of this valuable species through a high standard of research and compliance and pro-active co-operation amongst stakeholders.

1.3.2 Fishery Goals

The goals of the NSW Lobster Fishery are:

1. Manage the Lobster Fishery in a manner that promotes the conservation of biological diversity in the marine environment;
2. Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery;
3. Promote the conservation of threatened species, populations and ecological communities and protected species likely to be impacted by the operation of the Lobster Fishery;
4. Appropriately share the resource and carry out fishing in a manner that minimises negative social impacts;
5. Promote a viable commercial fishery, consistent with ecological sustainability;
6. Facilitate effective and efficient compliance, research and management of the Lobster Fishery;
7. Improve knowledge of the Lobster Fishery and the resources upon which the fishery relies.

Table 1.1 Snapshot of the major marine commercial fisheries in NSW (Source: NSW DPI licensing database extraction July 2006)

	Lobster	Abalone	Estuary general	Ocean trap and line	Ocean trawl	Ocean hauling	Estuary prawn trawl
Methods	Trap/pot	Diving (hookah)	Handline, Trap, Hauling net, Mesh net, Hand collecting	Fish trap, Spanner crab net, Setline, Trotline, Driftline, Poling Handline, Jigging, Dropline, Trolling	Otter trawl net	General purpose haul net, Garfish haul net, Purse seine net	Otter trawl net
Key species	Rock lobster (eastern)	Black lip abalone	Yellowfin bream, Luderick, Dusky flathead, Sand whiting, Longfinned eels, Sea mullet, Pipis	Snapper, Leatherjackets, Bonito, Kingfish, Morwong, Blue-eye, Spanner crabs, Silver trevally	King prawn, School prawn, Royal red prawn, Balmain bugs, Octopus, Silver trevally, Tiger flathead, Redfish, Calamari, School whiting	Sea mullet, Australian salmon, Blue mackerel, Sea garfish, Luderick, Yellowtail, Pilchards	School prawn, King prawn
Total catch in 2004/05 (t)	103	189	4049	1511	3970	5575	383
Est. value in 2004/05 (A\$m)	3.8	8.0	18.2	8.4	23.0	12.5	2.0
No. of fishing businesses (July 2006)	140	48	654	478	299	300	198
Standard boat length (m)	6-8	6	5	6-8	14	4	9
General no. of unlicensed crew	0-1	1	0*	0-1	2-3	0**	1

* Unlicensed crew permitted only when undertaking boat based prawn seining

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

2. Relevant Legislation and Policy

2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) was defined under the National Strategy for ESD as “development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends”. It can be achieved through the implementation of the following principles and programs¹:

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

2.2 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:

- 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 objectives:
- 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.*

In meeting these objectives, Division 4 of Part 2 of the FM Act establishes a Total Allowable Catch Setting and Review Committee (TAC Committee), to determine a specified total allowable catch for the Lobster Fishery, as required by the lobster share management plan. In determining the

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

Total Allowable Commercial Catch (TACC), the TAC Committee is required to have regard to all relevant scientific, industry, community, social and economic factors impacting on the resource. In addition, section 30 of the FM Act requires:

The TAC Committee is also to have regard to:

- a) the need to ensure the exploitation of fisheries resources is conducted in a manner that will conserve fish stocks in the long term, and*
- b) the impact of fishing activities on all species of fish and aquatic environment, and*
- c) the precautionary principle, namely, that if there are threats or serious or irreversible damage to fish stocks, lack of scientific certainty should not be used as a reason for postponing measures to prevent that damage.*

2.3 Arrangements with the Commonwealth and other States

The extent and scope of the NSW Lobster Fishery and any entitlements issued therein are subject to arrangements made from time to time between the State of NSW and the Commonwealth and other State governments over the management of particular fisheries. Section 135 of the FM Act enables the State of NSW to make arrangements with the Commonwealth under the powers of the Commonwealth *Fisheries Management Act 1991* and section 141A of the FM Act gives the power to enter into agreements with other States. Refer to Part 5 of the FM Act and sections 71-78 of the Commonwealth Act for further information on the power to make (and terminate) arrangements.

Arrangements made under the Act can effectively modify the waters and the fishing methods that fall under the jurisdiction and law of NSW. At the commencement of this FMS, a series of significant arrangements known as the 'Offshore Constitutional Settlement' (initially made in 1990) are in place that cede jurisdiction of fishing for certain species (including rock lobster) in certain waters beyond 3 nm to the State of NSW.

The FMS will apply to all waters under NSW jurisdiction following any changes to the arrangements made between NSW and the Commonwealth or other states.

2.4 Fishery Management Framework

The Lobster Fishery is included in Schedule 1 of the FM Act and is a Category 1 share management fishery. The FM Act requires that a share management plan be developed and implemented for all share management fisheries. The Lobster Share Management Plan containing the *Fisheries Management (Share Management Plan) Regulation 2000* (FM (Lobster SMP) Regulation) commenced in February 2000. Following the commencement of the FMS for the Lobster Fishery, the share management plan will be revised.

The primary role of a share management plan is to provide the legislative framework for the fishery and the rights and responsibilities of shareholders in a share management fishery. The share management plan provides for a range of fishery specific controls to be formalised into a regulation. Examples of these include the species that may be taken, the areas for taking fish, the use of boats, fishing gear and bait in the fishery.

The management plan for the Lobster Fishery will be amended to bring into operation any modified or new controls in the fishery that are described in this FMS.

The share management plan must include objectives and performance indicators which, for the Lobster Fishery, will be revised to be consistent with the goals and objectives of this FMS. 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 currently in the management plan will be revised, where necessary, to ensure it complements the review process outlined in this FMS. This will ensure there is a robust review and reporting framework for the fishery that is underpinned by the provisions of the management plan. In addition to these performance-based reviews, the share management plan will also be subject to scheduled periodic review.

2.5 The NSW Environmental Planning and Assessment Act

Division 5 of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) requires an environmental impact statement to be prepared for each designated fishing activity described in Schedule 1A of the FM Act, for the purposes of an environmental assessment.

Prior to the environmental impact statement being prepared, a draft FMS must be prepared under the FM Act. The environmental impact statement assesses the likely impact of implementing the draft FMS on the biophysical, economic and social environments.

Once a FMS and environmental impact statement has been prepared and subject to a determination by the Minister for Primary Industries (under s.115O(4) of the EP&A Act), the requirement to undertake an environmental assessment for each individual fisher's licence approval or renewal does not apply.

2.6 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 the 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 concurrently repealed). The new Part 13A of the EPBC Act has the effect of removing the previous blanket exemption from export control that historically applied to marine species. As a result, the export of all marine organisms falls under the control of the EPBC Act and is subject to ecological sustainability assessments based on guidelines established by the Commonwealth. 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. The declarations generally have conditions attached that will bring the management and operations of the fishery in line with the Commonwealth guidelines. Once declarations are made, exporters may need to apply for and obtain a permit from the Department of the Environment and Heritage (DEH) to export.

The EIS prepared for the Lobster Fishery was submitted to the Commonwealth Government for export approval. The Commonwealth has since issued a number of Wildlife Trade Operation (WTO) export approvals for the fishery (refer to www.deh.gov.au for further details).

2.7 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. It is also important that the Lobster Management Advisory Committee participates in the consultation over the proposed zoning arrangements in marine protected areas, as such areas can be beneficial to all sectors of the community, including the commercial fishing sector. However, zoning arrangements also have the potential to impact on the operations of lobster fishers.

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

Up to date information on the creation and zoning of marine parks in NSW waters is available on the Marine Parks Authority website: www.mpa.nsw.gov.au

2.8 Changes to Regulations

Most of the current regulations that apply to the Lobster Fishery appear in the FM (Lobster SMP) Regulation and the *Fisheries Management (General) Regulation 2002* (FM (General) Regulation). These regulations set out the working arrangements that underpin the provisions of the FM Act, and are made pursuant to that Act. For example, an offence appears in the FM Act for possessing prohibited size fish (section 16), however it is the FM (General) Regulation that prescribes the fish species subject to size limits and what those size limits are (clause 9). The FM Act also prohibits a person who holds shares in a share management fishery from taking fish in the fishery

unless the fisher has the minimum shareholding. However, it is the FM (Lobster SMP) Regulation that defines what the minimum shareholding is.

If the FM (Lobster SMP) Regulation is inconsistent with any other regulation or fishing closure, the FM (Lobster SMP) Regulation prevails. The only occasions where the FM (Lobster SMP) Regulation does not prevail over another regulation are where the regulation specifically expresses that it is to have effect despite the management plan or where the management plan specifies that other controls apply. An example of when this may occur is where a short-term closure may be introduced in response to an emergency. Therefore, the share management plan is the appropriate tool used to implement controls that are specific to the Lobster Fishery.

This FMS includes a number of actions that will impact on the current regulations that apply to the fishery. Where necessary, existing regulations will be amended or new regulations introduced to give effect to the actions and programs outlined in the FMS.

2.9 Indigenous Fisheries Strategy

Fishing has been an integral part of the cultural and economic life of Aboriginal communities since they have been in this land. Fishing has been an important source of food, a basis for trade and an important part of cultural and ceremonial life. Traditionally, Aboriginal fishers had responsibility for providing not just for themselves but for family and community. These cultural expectations continue in Aboriginal communities today, particularly in regard to improved access to fisheries resources.

In December 2002, the NSW Indigenous Fisheries Strategy and Implementation Plan (IFS) was released (NSW Fisheries 2002). The IFS seeks to protect and enhance the traditional cultural fishing activities of Aboriginal communities, and ensure Aboriginal involvement in the stewardship of fisheries resources. There are some issues that will be addressed immediately by the IFS and others that will only be resolved after lengthy negotiation involving Aboriginal communities, the broader community, fishing groups and government agencies. The IFS puts in place a process which will ensure discussion and negotiation can continue with progressive resolution of problems and challenges (see NSW Indigenous Fisheries Strategy and Implementation Plan, 2002).

While the relationship between Indigenous fishing and the Lobster Fishery is probably not as direct as with the inland, estuarine or beach-based fisheries, there are linkages with lobsters taken in the Lobster Fishery which spend part of their life cycle in nearshore waters. To better understand the linkages between this and other fishing activities to Indigenous issues, a substantial research study has been proposed through the IFS that seeks, among other things, to identify the species, areas and harvesting techniques of cultural importance to Aboriginal people in NSW.

Furthermore, although Aboriginal participation in the Lobster Fishery is limited, Aboriginal people aspire to be more involved in the fishery on a commercial basis. Such aspirations were identified as recently as June 2003 during an Indigenous Fisheries Strategy workshop. The workshop identified fishing closures, licence transfer rules, market value of entitlements and the gradual decline of Aboriginal commercial fishers in the industry as constraints for Indigenous involvement in commercial fisheries.

3. Fishery Description

3.1 Extent of the Fishery

3.1.1 Number of operators

As of August 2006, there were 141 shareholdings in the fishery, with individual shareholdings ranging from 12 to 328 (source: Lobster Fishery Share Register). This number, however, constantly varies due to a number of factors including the transfer of shares. Shareholders may fish themselves or nominate another person to take rock lobster on their behalf, subject to minimum shareholding provisions. Shareholders may also choose to not fish some or all of their lobster quota but lease it to other shareholders in the fishery.

This FMS includes an investigation into the benefits of using minimum shareholdings to improve the economic viability of the fishery by reducing the number of smaller shareholdings in the fishery.

3.1.2 Area of operation

The Lobster Fishery extends the length of the coastline of NSW, from the Queensland border to the Victorian border. It includes all State waters out to 3 nm and those Commonwealth waters within the jurisdiction of NSW under the Offshore Constitutional Settlement² (see Figure 3.1). The fishery does not operate in inland waters.

There is no zoning within the Lobster Fishery however there are distinct inshore and offshore components which operate quite differently within the fishery. The stock is managed as one unit along the coast of NSW.

Lobster fishers work out of ports along the entire NSW coast and can relocate their operations within the area of the fishery, without restriction. The Lobster Fishery does not have a closed season. Fishing effort is concentrated at different times along the NSW coast and throughout the range of depths fished. Apart from area closures to commercial fishing such as those in marine protected areas, marine parks and aquatic reserves, there are currently no fishery specific area closures in place.

Habitat management

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. Habitat management plans can potentially close areas to commercial fishing and other activities. The Lobster MAC will provide advice and contribute to any reviews of the NSW DPI habitat management policy and guidelines or habitat protection plans, where they relate to areas fished by the Lobster Fishery. This may include nominating priority lobster habitat areas for protection and management.

Commercial fishers are often aware of the key habitat areas for fishery production. This knowledge can assist the NSW DPI to identify and prioritise sites that may benefit from rehabilitation and potentially contribute to increased fishery production. This knowledge may include identifying the location and original extent of the habitat area, sizes of lobsters that occupied the area, and the habitat values that attract the lobsters to these areas.

² An offshore constitutional settlement was reached between NSW and the Commonwealth in 1990 that defines jurisdiction over specific fisheries by area, species and gear type for waters outside 3 nm (i.e. outside state waters) to within the 4000 metre isobath (about 80 nm offshore).

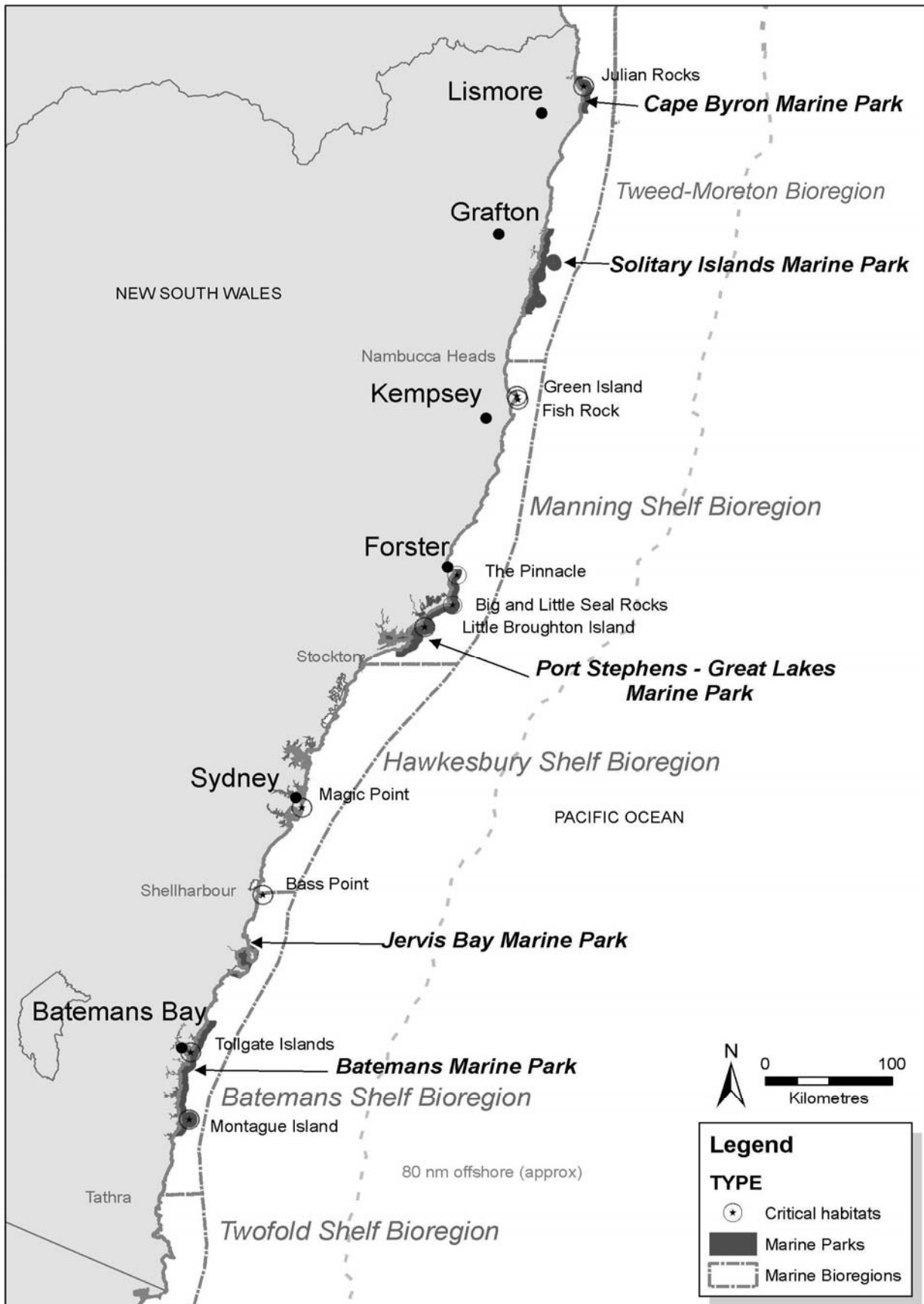


Figure 3.1 Map of the area of the Lobster Fishery including marine bioregions, marine parks and grey nurse shark critical habitats.

3.1.3 Activities endorsed in the fishery

Lobsters may only be taken in the Lobster Fishery by hand picking or by use of a commercial lobster trap. Diving for lobsters is only permitted without the use of any underwater breathing apparatus.

Lobster traps may be set and retrieved by a lobster fisher from a licensed commercial fishing boat. Traps may also be grappled from the shore.

Fishing gear

The fishery primarily uses traps to take lobsters and these vary in design including D-shaped, rectangular and beehive trap shapes depending on the location and depth at which they are used. Trap dimensions are detailed in the FM (Lobster SMP) Regulation and summarised in Table 3.1. Other restrictions relating to the use of fishing gear in the fishery are set out in the FM (Lobster SMP) Regulation.

The internal structure of all traps must not contain any compartments or be obstructed by any material that would prevent the free movement of lobsters within the trap.

Table 3.1 Dimensions of commercial lobster traps permitted to be used in the Lobster Fishery.

Waters	Description		
	Base	Height	Mesh
Any waters (other than inland waters and ocean waters more than 10 metres deep (contour))	Rectangular base $\leq$ 1.2 m by 1.2 m (if circular, $\leq$ 1.2 m in diameter)	Not defined	Not defined
Ocean waters more than 10 metres deep (contour)	$\leq$ 2 m in length and $\leq$ 2 m in width	$\leq$ 2 m	$\geq$ 50 mm

Operation of fishing gear

Each lobster trap set in waters up to 10 m in depth must be marked by a buoy that is positioned above the trap, or a plastic tag or concrete block of an approved size and type. For traps marked with a buoy, a weight of not less than 50 g must be suspended not less than 1.5 m under the float so that no excess rope is floating on the surface of the water. The buoy must have a diameter above the water of at least 100 mm.

All buoys, tags and concrete blocks used to identify lobster traps, must be marked with the “FB” (fishing business) number of the fishing business with which the traps are associated and “L” at the end of the number. These markings must be in clearly visible figures not less than 50 mm in height and in a colour that contrasts with that of the trap marking device.

In certain inshore waters lobster fishers are required to mark the position of the trap using either a plastic tag or concrete block rather than a float for safety reasons. Lobster traps (including any attached rope and float) set in ocean waters greater than 10 m in depth may be totally submerged if the trap is set using a time release mechanism.

Although inshore traps are attended to on a regular basis, access to offshore traps is more difficult and traps may be left for periods of up to two weeks or more before they are checked. Retrieval of traps from offshore waters can be difficult due to strong currents which submerge marker

floats. There are no restrictions on the length of time that a lobster trap is set (i.e. soak time) in the fishery.

Weights may be attached to the lobster traps to prevent currents from moving them once they are set. A number of materials may be used to weight traps, including concrete blocks, steel bars, bricks etc.

Lobster fishers are not permitted to set lobster traps once their allocated quota of eastern rock lobster has been taken for the season, unless they hold quota transferred from another shareholder.

Considerable conflict has arisen in the past over the interference with set fishing gear by other fishers either in the same or other commercial fisheries (e.g. moving traps, cutting ropes/buoys, blocking trawl paths). In order to reduce conflicts clause 108 of the FM (General) Regulation prohibits the interference of set fishing gear (other than by a fisheries officer or the fisher who set the gear). This FMS (in management response 1.1(e)) proposes to identify and map major lobster trapping grounds to assist in the management of fishing operation interactions between the Lobster Fishery and other activities, including other commercial fisheries and recreational fishing. It also (in management response 4.5(a)) proposes to identify, in consultation with the Lobster MAC, areas of high interaction between the Lobster Fishery and other resource users and respond appropriately to any conflicts.

The operation of commercial fishing gear including machinery, boats, powered winches etc means that lobster fishers may be exposed to a variety of occupational health and safety (OH&S) risks. Commercial fishers are required to operate in a manner consistent with the OH&S legislation which is administered by Workcover NSW. Whilst safety issues are outside the jurisdiction of the NSW DPI, this strategy promotes adherence to OH&S requirements and cooperation with the relevant authorities.

Boats

The inshore component of the fishery utilises predominantly small, 4-6 m boats. These vessels are usually aluminium runabouts with outboard motors. The offshore fishery is dominated by larger trap and line vessels, typically greater than 8 m in length. All boats used in the Lobster Fishery must be licensed fishing boats (see section 4.4 of this FMS for boat licensing arrangements).

Storage of live rock lobsters

Lobster fishers may store live rock lobsters in clearly identifiable holding pens which are sealed to prevent the entry or exit of lobsters. Pens must not exceed the dimensions of commercial lobster traps permitted in those waters. The location of the holding pen must be recorded on the fisher's daily log sheet each time lobsters are stored in the pen. The location of any other storage facility for live rock lobsters must be recorded on a fisher's daily log sheet.

3.2 Species

3.2.1 Species allowed to be taken in the Lobster Fishery

Target species

The eastern rock lobster *Jasus verreauxi*, a decapod crustacean of the family Palinuridae, is the only target species of this fishery. Catches of eastern rock lobster represent more than 99% (by weight) of all rock lobster species in the commercial catch. Less than 1% of the catch comprises southern rock lobster *Jasus edwardsii* (taken in the south of the state) and species of painted rock lobster *Panulirus longipes* and *Panulirus ornatus* (taken in the north of the state). The fishery does not report byproduct other than southern and painted rock lobster species, however catches are monitored through an ongoing observer survey (G. Liggins, NSW DPI, *pers. comm.*).

Eastern rock lobsters inhabit the waters off the east coast of Australia from Tweed Heads southwards around the Tasmanian coast and as far west as the Victoria-South Australia border (Montgomery and Chen, 1996). Because of the low abundance of eastern rock lobster in other states, the NSW Lobster Fishery is the only commercial fishery in Australia that targets this species. The species is also found and commercially fished in the northern waters of New Zealand; however it appears to be genetically discrete from the Australian stock (Brasher *et al.*, 1992).

The distribution of eastern rock lobster across habitats and along the coast is related to size and age. Sexually mature eastern rock lobsters are concentrated on the north coast of NSW. The smallest size at which 50% of females bear eggs during the egg-bearing season (i.e. size at onset of breeding) is 167 mm CL (Montgomery, 1992). Spawning occurs in waters north of Port Stephens from September to January (Spring through to Summer) in depths of less than 50 m, during which time females carry eggs on the tiny hairs of their pleopods (appendages adapted for swimming). A female eastern rock lobster may carry 400 thousand to 2 million eggs under her abdomen (Kensler, 1967), and the larger the female the more eggs she can carry. Eggs are released in early to mid summer.

There are several planktonic larval stages in the rock lobster's lifecycle. After hatching, phyllosoma larvae spend approximately a year in ocean waters off the coast before moulting into a puerulus stage. Pueruli swim across the continental shelf to settle in rocky-reef sub-tidal habitat along the NSW coast. Only a very small proportion of larvae survive this first year. Most are eaten by predators or are not brought close enough to the coast for settlement on inshore reefs. After moulting through several puerulus stages, juvenile lobsters spend several years on these shallow rocky reefs. From the puerulus to early juvenile stages, lobsters are thought to be asocial, and occur principally within forests of macroalgae or within beds of seagrass in waters from the intertidal zone to depths of 30 m. It is believed that lobsters then aggregate and move en masse offshore (at a size of about 120 mm carapace length (CL)) and migrate from the south to the north coast of NSW. Adult rock lobsters generally live in aggregations from depths of around 10 m to those of the continental slope (Montgomery, 1990, 1995). From the older juvenile stage onwards, lobsters aggregate by day and roam alone at night.

The size of lobsters caught in waters on the edge of the continental shelf off the central and southern coasts of NSW is generally 120-150 mm CL. Large (and sexually mature) lobsters are found at their greatest abundance on the north coast of NSW. Results from a research tagging program have also demonstrated such longshore northward migrations.

Eastern rock lobster is the largest species of rock lobster known (Phillips *et al.*, 1980). They are known to live for over ten years, attain a maximum length of 1 m (total length) and a weight in excess of 8 kg. Eastern rock lobster takes about 3 to 5 years from hatching to reach the minimum legal harvest size, and an additional 4 to 5 years for females to reach the average size at maturity of 167 mm. For animals of approximately legal size, two to three moults take place annually, with carapace increments of about 6-7 mm for each moult. Eastern rock lobsters are omnivorous. They eat bottom living organisms such as molluscs and crustaceans among rocks and seagrass, and scavenge on dead organic matter. Octopus and various shark species are their major predators, although small juvenile lobsters may be eaten by finfish.

Byproduct species

All retained species other than eastern rock lobster are considered byproduct species in the fishery. The following table identifies the species of rock lobster permitted to be taken as byproduct in the Lobster Fishery.

Table 3.2 Rock lobster byproduct species taken by the Lobster Fishery.

Common name	Taxonomic name
Southern rock lobster	<i>Jasus edwardsii</i>
Painted rock lobster	<i>Panulirus</i> spp.

Endorsement holders cannot, while trapping waters of less than 10 m in depth, retain any species as byproduct other than the rock lobster species listed above.

When trapping in ocean waters more than 10 m in depth, fishers endorsed in the Lobster Fishery may only take those species listed in Table 3.3 as byproduct, in addition to the rock lobster species listed in Table 3.2. However, fishers holding endorsements in both the Lobster Fishery and Ocean Trap and Line Fishery (*ie.* a demersal fish trap endorsement) may take other fish species (permitted under the Ocean Trap and Line FMS) as byproduct when trapping in ocean waters more than 10 m in depth. In order to get a better understanding of the composition and quantity of byproduct species taken in the Lobster Fishery, the catch reporting system will be amended to include records of all byproduct species taken by all lobster fishers (see management response 2.3(d)).

Many species of byproduct that may be taken in the Lobster 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 bodies that provide advice to the Minister for Primary Industries on cross-fishery management issues. The NSW DPI will also work with adjacent jurisdictions to consider consistent management regimes for shared species and to discuss initiatives such as stock assessment, complementary size limits, monitoring programs and recovery programs for overfished species. Cross jurisdictional collaboration has occurred often on an as-needed basis in the past; and the NSW DPI will seek to establish a more formalised approach to joint management. Although byproduct species have not been recorded in the Lobster Fishery, the observer survey (Liggins *et al.*, in prep.) has identified species commonly taken as byproduct in this fishery for the purposes of identifying a byproduct species list (Table 3.3).

Table 3.3 Byproduct species (other than rock lobster species) permitted to be taken by lobster fishers when trapping in waters deeper than 10 m.

Common name	Taxonomic name
Banded (Bar) rockcod	<i>Epinephelus ergastularius</i>
Blind shark	<i>Brachaelurus waddi</i>
Catfish	PLOTOSIDAE spp.
Catsharks, Swellsharks	SCYLIORHINIDAE spp.
Crimsonband wrasse	<i>Notolabrus gymnogenis</i>
Cuttlefish	<i>Sepia</i> spp.
Eastern red scorpionfish	<i>Scorpaena cardinalis</i>
Eastern wirrah	<i>Acanthistius ocellatus</i>
Foxfish, Pigfish	<i>Bodianus</i> spp.
Hermit crabs	PAGURIDAE spp.
Leatherjackets	MONACANTHIDAE spp.
Maori wrasse	<i>Ophthalmolepis lineolatus</i>
Ocean perches (Bigeye & Reef)	<i>Helicolenus barathri</i> , <i>H. percoides</i> .
Octopus	<i>Octopus</i> spp.
Redfish	<i>Centroberyx affinis</i>
Silver trevally	<i>Pseudocaranx dentex</i>
Slipper lobsters	<i>Scyllarides</i> spp.
Silver sweep	<i>Scorpius lineolatus</i>
Striped trumpeter	<i>Latris lineata</i>
Wobbegong sharks	<i>Orectolobus maculatus</i> , <i>Orectolobus ornatus</i> , (<i>Orectolobus halei</i> *)

* Possible third species of wobbegong shark not presently recognised in catch data.

3.2.2 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. The only bycatch associated with skin diving for lobsters are non-retainable lobsters (see below) which may be removed from their shelter by the diver and then released if found to be non-retainable. The magnitude of bycatch from lobster trapping is considered inconsequential in comparison to catches and bycatch from other less selective fishing methods (Kennelly & McVea, 2001). Bycatch in the Lobster Fishery can generally be classified as either ‘non-retainable lobsters’ or ‘other fish species’.

Non-retained lobsters

Lobsters in the categories listed below may not be retained by any fisher in NSW.

- Rock lobsters carrying eggs (known as ‘berried females’)

- Eastern rock lobsters less than 104 mm CL (undersized lobsters)
- Eastern rock lobsters greater than 200 mm CL (oversized lobsters)
- Southern rock lobsters less than 110 mm CL (males) and less than 105 mm CL (females).

Lobster fishers are required to report the number of undersized, oversized and berried eastern rock lobsters discarded each fishing day.

Other fish species

Although eastern rock lobsters are targeted in the fishery, a variety of fish species may be inadvertently captured in lobster traps. Any fish species, other than rock lobster, taken in traps set in waters less than 10 m deep can not be retained. Lobster fishers may choose to retain or discard fish species if taken from waters deeper than 10 m. However, if lobster fishers are not also endorsed in the Ocean Trap and Line Fishery with a demersal fish trap endorsement, all species, other than those listed in Table 3.3, must be discarded. Although bycatch (other than eastern rock lobster) is not regularly reported by lobster fishers, the observer program (see management response 1.2(b)) will periodically collect information on the quantity and composition of bycatch into the future.

Bait used in the fishery

The Lobster Fishery utilises a variety of products to bait traps. Mullet and luderick taken in other NSW commercial fisheries are primarily used as bait in inshore lobster traps and may be used fresh, salted or dried. Other fish species are also used. Some offshore lobster fishers use meat products (e.g. bones) in their traps as it takes longer to break down. Others use fish frames, particularly tuna, which in some cases are sourced from other states. Bait used in offshore traps may be fresh, salted, dried or a mixture of these.

3.2.3 Size limits

The eastern rock lobster is subject to regulated minimum and maximum size restrictions. Carapace Length (CL) is used to measure the size of lobsters. The length of the carapace of a rock lobster is measured along the straight line from the point of union of the second antennae to the centre of the posterior margin of the carapace ignoring any hairs attached to the carapace (see Figure 3.2). Lobster fishers are required to carry a suitable measuring device whilst operating in the fishery.

The legal minimum size for eastern rock lobster is 104 mm CL. It is also subject to a current legal maximum size of 200 mm CL but this will be reduced to 180 mm CL (see management response 2.2(a)). The maximum size limit aims to protect the older mature animals from fishing as they contribute more strongly to egg production. Eastern rock lobsters of a smaller legal size generally receive a higher price per kg at market, as consumers prefer them. The minimum legal size for southern rock lobster is 110 mm CL for males and 105 mm CL for females. No maximum size limit applies to this species.

Size limits apply to a number of finfish species that may be taken as byproduct by lobster fishers also endorsed in the Ocean Trap and Line Fishery or discarded as bycatch in the Lobster Fishery (Refer to clause 9 of the FM (General) Regulation). The FMS for the Ocean Trap and Line Fishery includes consideration of a minimum legal size for wobbegong sharks; species that are permitted to be retained by lobster fishers when operating in waters deeper than 10 m. This size restriction would apply to all commercial fisheries in NSW at the time it takes effect.

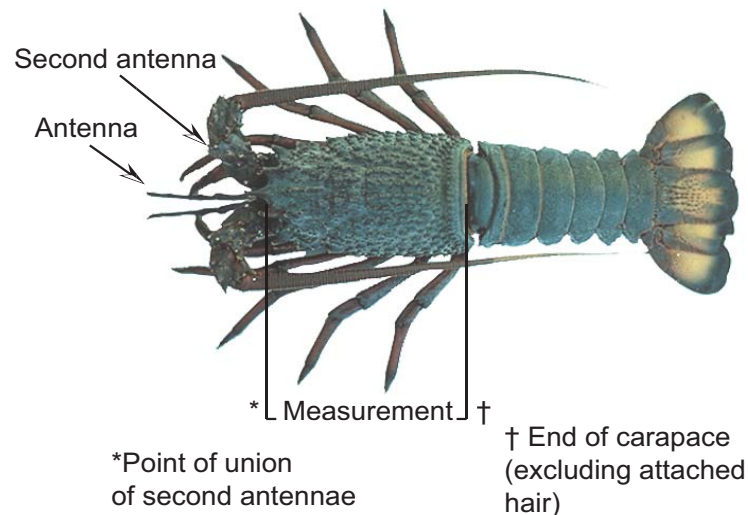


Figure 3.2 Measurement of carapace length of eastern rock lobster.

3.2.4 Status of the stock

The NSW DPI uses a standardised method of reporting on the exploitation status of fish stocks across all commercial fisheries. Catch from all sectors (including estimates from recreational and illegal sectors) are taken into consideration when determining the status of a species. This reporting method uses the terms defined in Table 3.4 to describe the stock status.

Table 3.5 outlines the current status of the target and byproduct species taken in the Lobster Fishery. A number of species are classified as “undefined” and “uncertain”. This FMS includes responses to measurably improve the quality of reported information on byproduct species, including amending the catch reporting system to record all byproduct species.

Overfished species

If a species taken in this fishery is determined as ‘overfished’ (either of the three types of overfishing), this FMS requires the implementation of, or assistance in developing, a recovery program for that species (see management response 2.4a). However, a recovery program is not required for species that are determined as growth overfished if the Director-General, NSW DPI, considers that the combination of the existing harvest strategy and life history characteristics of the species provides sufficient protection for the stock from the effects of fishing.

The process of developing a recovery program for an overfished species initially involves the NSW DPI preparing a summary of the known factors that have led to the determination being made. In addition to the summary, a range of management options will be identified and outlined. Consultation will then formally commence with the relevant MAC and advisory bodies. The recovery program will be developed under the FMS for the fishery which is the key harvester of the species concerned, and must include a description of the actions proposed to return to acceptable levels those parameters that have led to the determination of the species being ‘overfished’. The recovery program will also set out a timeframe for that process (including annual review) and may specify further appropriate action should recovery targets not be met.

Table 3.4 The characteristics of the categories of exploitation status that are used to determine the status of key species.

Category	CHARACTERISTICS
Recruitment overfished	• Recruitment is being significantly or measurably suppressed as a result of a small spawning biomass • Other characteristics of an ‘overfished’ stock (see below) are likely to be evident • Unequivocal determination will require a well-calibrated population model or stock-recruitment relationship
Overfished	• Fishing mortality rates are more than double natural mortality rates • Estimates of biomass are less than 30% of the estimated unfished stock • Catch rates are less than 30% of the initial catch rates • Length and age distributions unstable (excessively affected by recruitment, too few age or size classes in the exploitable population given a species’ life history) • Trends in length/age compositions are evident which indicate increasing (and/or excessive) fishing mortality • The ‘Spawning Potential Ratio’ is less than 20%
Growth overfished	• Yield per recruit would increase if length at first capture was increased or fishing mortality decreased.
Fully fished	• Fishing mortality is approximately the same as natural mortality • Estimates of the biomass are greater than 30% of the estimated unfished biomass • Catch rates have been steady for 5-10 years and/or catch rates are greater than 30% of initial catch rates. • Length and age distributions are stable • Species are fished throughout their entire geographic range
Moderately fished	• Fishing mortality is less than half of natural mortality • Estimates of the biomass are greater than 70% of the estimated unfished biomass • Catch rates are greater than 70% of initial catch rates • Species are fished in most of their geographic range but non-fishing areas are known to exist
Lightly fished	• Fishing mortality less than 25% of natural mortality • Estimates of the biomass are greater than 90% of the estimated unfished biomass • Catch rates are greater than 90% of initial catch rates • Only small proportions of the geographic range are fished • Markets would likely limit catch and effort
Uncertain	• A significant amount of evidence has been collected and considered, but there are inconsistent or contradictory signals in the data that preclude determination of exploitation status
Undefined	• Catch data are available but no reasonable attempt has been made to determine exploitation status

Source: NSW Department of Primary Industries (2006).

Table 3.5 Exploitation status of target and byproduct species taken in the Lobster Fishery.

Species category	Common Name	Stock Status
Target Species	Eastern rock lobster	Fully fished
Byproduct Species	Southern rock lobster	Fully fished
	Painted rock lobsters	Uncertain
	Slipper lobsters	Uncertain
	Hermit crabs	Uncertain
	Wobbegong sharks	Undefined
	Redfish	Growth overfished
	Leatherjackets	Uncertain
	Octopus	Uncertain
	Blind shark	Undefined ^
	Silver trevally	Growth overfished
	Eastern red scorpionfish	Undefined ^
	Cuttlefish	Uncertain
	Striped trumpeter	Undefined ^
	Catsharks, Swellsharks	Undefined ^
	Eastern wirrah	Undefined ^
	Catfish	Undefined
	Maori wrasse	Unknown
	Bar (banded) rockcod	Undefined
	Crimsonband wrasse	Undefined
	Ocean perches (Bigeye & Reef)	Fully fished
	Foxfish, Pigfish	Undefined ^, Undefined
	Silver sweep	Moderately fished

^ Species are not formally identified in the RAS. Species composition of catch data needs to be better determined before any assessment of status can be made.

Definitions of overfished status

The NSW DPI Resource Assessment System (Table 3.4) uses a continuum of three categories of overfishing which, when detected, in most cases require management action. “Growth overfishing” occurs when individual fish are typically harvested under the size that takes best advantage of the species growth in relation to expected natural mortality. “Recruitment overfishing” is the most serious form of overfishing and occurs when fishing pressure has reduced the ability of a stock to replenish itself, *i.e.* the size of the spawning biomass is so reduced as to compromise recruitment. Between these two categories, the general term “overfishing” is used to capture situations that represent excessive fishing mortality being placed on a stock with the result that it is likely to have a small relative spawning biomass and suppression of recruitment. However, significant measurable evidence that would confirm the stock’s status as ‘recruitment overfished’ is lacking.

Designating 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.

The NSW DPI will consider advice from fisheries scientists as part of the annual assessment of the status of fish stocks in NSW. 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 resource assessment process, as is the case with eastern rock lobster, the indication of overfishing is likely to come from having a performance indicator outside acceptable limits. The status of species taken as byproduct in the Lobster Fishery will be reviewed on the basis of the best available biological and catch information.

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 a species is targeted in a spawning aggregation), decreases 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 the NSW DPI, the Department's fisheries scientists will review the status determination for that species against the criteria specified in Table 3.4 and report on the updated status. 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 sub-optimal due to the harvesting of 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, 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. Nevertheless, the primary objective of a recovery program for growth overfished species should be to improve the management of a stock to ensure sustainability and optimise economic yield at a fully fished status.

Recovery programs for species suspected of having depressed recruitment due to overfishing (ie. species determined as 'overfished' or 'recruitment overfished') must include strong precautionary action to prevent the risk of stock collapse. Actions could include (but may not be limited to) temporary fishery closures, direct limits on catch, bycatch management provisions or mandatory gear

changes. 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 overfished

As the Lobster Fishery is not a major harvester of any overfished species in NSW, there are no recovery programs proposed at the commencement of the FMS to be developed and implemented by the Lobster Fishery.

There are currently two species, taken as byproduct in the Lobster Fishery, considered growth overfished: redfish and silver trevally. Preliminary results of the observer survey provide estimates of the total quantities of each species taken in the Lobster Fishery as byproduct (Liggins *et al.*, In Prep.). As quantities of each species taken in the Lobster Fishery have not historically been recorded, precise quantities taken are not available. However, it is considered that the Lobster Fishery is a minor harvester of these species. Under this strategy the fishery will implement any relevant provisions of the recovery programs developed under the management strategies of other fisheries (e.g. the Ocean Trawl Fishery for silver trevally). The Commonwealth trawl sector of the Southern and Eastern Scalefish and Shark Fishery (SESSF) is the major harvester of redfish, and should a recovery program be implemented within the Commonwealth fishery, the NSW Lobster Fishery is committed to implement the provisions of such a program.

The resource assessment available for redfish taken in the Commonwealth SESSF indicate the stock is growth overfished. Cod-end regulations will be introduced under the FMS for the Ocean Trawl Fishery to help improve the status of this slow growing, long lived species. The monthly reporting for the Lobster Fishery will be amended in accordance with this FMS to provide for the quantity of all byproduct species taken in this fishery to be recorded (see management response 2.3(d)). Following collection of such information for a period of two years, an assessment of whether any direct action is required under the Lobster FMS to assist the recovery of redfish, may be required.

The Ocean Trawl FMS is developing a recovery program for silver trevally including the introduction of a minimum legal length for silver trevally of 30 cm. The Lobster Fishery will need to comply with the provisions contained within that recovery program.

3.2.5 Protected fish and threatened species

Commercial fishers are not permitted to take either protected fish or fish protected from commercial fishing (refer to management response 3.1(c)). These species are listed in clause 6 and clause 7 of the FM (General) Regulation respectively. In addition, Part 7A of the FM Act aims to conserve biological diversity by listing and protecting threatened species, populations and ecological communities. Lobster fishers are not allowed to retain these species and are required to return them to the water without harm if encountered in their operations. Threatened species, populations and ecological communities are listed in Schedules 4 and 5 of the FM Act.

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*. Such species may be classified as threatened, endangered or vulnerable and cannot be taken by commercial lobster fishers.

Interactions with threatened species and protected species

Although interactions with threatened and protected species have not been formally recorded in this fishery, this FMS includes two direct measures to obtain data on any such interactions. The first of these measures is the continuation of a scientific observer program on a periodic basis which will *inter alia* collect data on interactions (see management response 1.2(b)). Secondly, a modification to the monthly reconciliation forms will incorporate reporting fishers' interactions with protected and threatened species during fishing operations (see management response 3.1(a)).

A number of management responses also appearing in this FMS, are aimed at minimising impacts on threatened species. These measures include educating fishers in the identification/avoidance of threatened and protected species, implementing provisions of any relevant threatened species recovery plans or threat abatement plans (management response 3.1(b)) and the use of closures to avoid direct interactions when necessary (management response 1.1(d)).

4. Management Controls and Administration

4.1 Lobster Share Management Plan

The Lobster Fishery is a category 1 share management fishery. The category 1 share management provisions allow for the allocation of shares into perpetuity, with the payment of statutory compensation for the market value of the shares if the Government decided to close the fishery and cancel the shares. The FM (Lobster SMP) Regulation commenced for this fishery in 2000. The management plan provides shareholders with a statutory basis for the future of their fishery and provides objectives, performance indicators and trigger points which aim to ensure that the fishery remains sustainable. It is made available to all shareholders and nominated fishers.

The FMS is the new strategic plan for management of the Lobster Fishery and effectively supersedes the management strategic plan published in the share management plan. The FMS takes a strategic approach to management of the Lobster Fishery through the implementation of a series of management responses to meet stated goals and objectives for the fishery. The FMS also provides a transparent process of measuring and reporting on performance of the fishery and progress in implementing each management response. The Lobster Share Management Plan will be revised to reflect the changes to the fishery outlined in this FMS.

4.1.1 Shareholdings

The total number of shares in the Lobster Fishery in January 2004 was 10,051. The maximum shareholding permitted in the fishery is 350 shares for any one fishing business. New entrants (ie. those who entered the fishery since 18 February 2000 when the share management plan commenced) must hold a minimum of 55 shares before an endorsement will be issued with respect to that shareholding. Management response 5.1(a) in section 9 of this FMS includes an action to investigate the introduction of a minimum shareholding applicable to all shareholders in the Lobster Fishery.

4.1.2 Share transactions

Share transactions in the Lobster Fishery include share transfer, assignment, transmission and mortgage. A share transfer is the standard way for a shareholder to pass a quantity of his or her shares on to another party. A share assignment is a transfer of shares which may be of a temporary nature. A share transmission is a transfer of shares in accordance with a will. A share mortgage occurs if shares become security for a loan.

Lobster shares may be transferred in share packages, each comprising 10 shares, unless otherwise approved. A shareholder may transfer all of the shares he or she holds in the fishery. Any applicable unused allocated quota is also transferred with the shares. If a person who held shares at the commencement of the share management plan for the fishery transfers or assigns any of those shares, then wishes to regain an endorsement in the fishery at a later time, the minimum shareholding in respect of that person increases to 55 to be eligible for an endorsement.

A shareholder may assign, transmit or mortgage their lobster shares to one or more persons (see management response 4.2(b)). Share transactions may be refused for a number of reasons, such as if:

- the transaction is to avoid share forfeiture;
- any fee or contribution under the FM Act is outstanding in respect of the shares;
- any assignment or mortgage of the shares has not been discharged or cancelled;
- the person to whom the shares will be transferred would be refused an endorsement in the fishery because of having been convicted of a rock lobster offence or a serious offence³ in the previous three years.

A foreign person or a foreign owned body is not permitted to own shares in the Lobster Fishery.

All share transactions must be registered in the Share Register to take effect. Fees for share transfer and transmission transactions are outlined in the FM (Lobster SMP) Regulation.

4.1.3 Management charges

The NSW Government policy on cost recovery for share management fisheries applies to the Lobster Fishery. The management charge is payable in proportion to a shareholding and is set by the Minister for Primary Industries to meet the costs of managing the fishery. Management fees contribute towards the fishery's compliance, research and management services.

The Independent Pricing and Regulatory Tribunal (IPART) has previously investigated the costs of managing commercial fisheries in NSW. The broad pricing principles identified by IPART (1998) are applied to the requirements of the Lobster Fishery in calculating the amount payable per share.

A range of other regulatory and administrative fees are payable by fishing business owners in the Lobster Fishery. The FMS does not, in itself, set the charges, limit or otherwise govern the way fees are charged. It is important to note that new services required to be implemented under the FMS as a result of the environmental assessment process will need to be fully funded by the fishery participants.

4.1.4 Community contribution

Shareholders in a category 1 share managed fishery are required to make a periodic contribution to the community for their right to access a community owned resource. The FM (Lobster SMP) Regulation requires payment of this contribution by each shareholder two months after the end of each fishing period. The level of community contribution was originally determined at a rate of 6% of the gross value of the fishery. The capacity of industry to meet the costs of management has been

³ Serious offence means: an offence against the FM Act or regulations that is punishable by imprisonment, an offence against clause 108 of the *Fisheries Management (General) Regulation 2002*, or an offence punishable under the *Crimes Act 1900*.

impacted by a number of factors including the costs attributable to the development of the FMS and environmental impact assessment for the fishery.

Arrangements have been made for the Lobster Share Management Plan to be amended so that lobster fishers are charged a community contribution of \$100 per shareholder per year (CPI adjusted to \$109 in 2004-05) until July 2008. An independent economic review of the fishery will occur by that time, with future community contributions based on the outcome of the review.

4.2 Quota management

Individual quotas are allocated (by weight) in proportion to shareholding on an annual basis. At present, the only species in this fishery subject to a total allowable commercial catch (TACC) is eastern rock lobster. The TACC is set by the statutory and independent Total Allowable Catch Setting and Review Committee (TAC Committee).

The TACC is allocated among all shareholders, including those who do not hold the minimum shareholding required to fish in the fishery⁴. Each shareholder and any nominated fisher of the shareholder, is notified of the shareholder's quota allocation and any period(s) in which that quota may be taken.

Quota can be transferred between shareholders throughout the fishing period. Management response 5.1(b) limits the amount of quota a shareholders may acquire through quota transfer to no more than an amount equal to his or her actual allocation for the fishing period.

4.2.1 Total Allowable Catch Setting and Review Committee

The TAC Committee consists of at least four members, including:

- a person appointed by the Minister for Primary Industries as the Chairperson of the TAC Committee, being a person who is neither engaged in the administration of the FM Act nor engaged in commercial fishing;
- a person appointed by the Minister who is a natural resource economist not employed by the Government;
- a person appointed by the Minister who is a fisheries scientist not employed by the Government;
- persons appointed by the Minister who have appropriate fisheries management qualifications.

In determining the total allowable catch for the Lobster Fishery the TAC Committee is to have regard to all relevant scientific, industry, social and economic factors. It must also have regard to the following:

- the need to ensure that the exploitation of fisheries resources is conducted in a manner that will conserve fish stocks in the long term;
- the impact of fishing activities on all species of fish and the aquatic environment;
- the precautionary principle.

The TAC Committee incorporates harvest estimates from other sectors, including recreational and illegal catch estimates when setting the TACC. Before the TAC Committee makes a

⁴ Shareholders who cannot actively take their share of the quota due to the minimum share holding requirement can still transfer their quota to other lobster fishers.

determination, it is required to call for public submissions and have regard to the submissions received within the timeframe fixed for the making of submissions.

Under section 29 of the FM Act the TAC Committee is not subject to any Ministerial control when making a determination, however, the Minister for Primary Industries may determine the procedure to be followed or matters to be considered by the TAC Committee when making a determination.

4.3 Commercial fishing licence

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. Whilst the right to take fish for sale originates from share ownership, the lobster fisher must hold a commercial fishing licence endorsed in the Lobster Fishery. A person applying for a commercial fishing licence endorsed in the Lobster Fishery must have a 3-year conviction free record for any rock lobster or serious fisheries related offence. They must also be applying in relation to a shareholding in the fishery of not less than 55 shares. Since the commencement of the share management plan for the fishery, new entrants who hold less than 55 lobster shares cannot obtain an endorsement in the Lobster Fishery.

4.3.1 Nominated fishers

Shareholders may nominate another person to take rock lobster on their behalf. Only one fisher can be nominated with respect to a shareholding at any one time. Similarly, nominated fishers may only work for one shareholder at any one time. The minimum nomination period is 48 hours⁵, unless otherwise approved by the Director-General, NSW DPI.

Nominated fishers are required to comply with the rules for the fishery, including the completion of log sheets. A nominated fisher is required to notify the relevant shareholder if he/she is charged with an offence under the FM Act, the FM (General) Regulation or the FM (Lobster SMP) Regulation.

4.3.2 Crew

To assist an endorsement holder in the Lobster Fishery, a person must hold a Class 3 commercial fishing licence. All licence holders operating as crew must be recorded on the daily log sheet. An application for a licence can be refused if the applicant has been convicted of a fisheries related offence under the law of NSW, the Commonwealth, another State, a Territory or New Zealand.

An endorsement holder may have unlicensed crew members present while working in the Lobster Fishery on up to two times in any calendar month.

4.4 Commercial fishing boat licence

Only commercially licensed fishing boats may be used in the Lobster Fishery. Vessels must have the relevant licensed fishing boat (LFB) number marked on the hull and the upper deck in clearly visible figures. Immediately preceding the 'LFB', the letters 'RL' must be displayed to indicate that the vessel is used in the Lobster Fishery.

There is no limit on the size or type of vessel used in the Lobster Fishery, however many fishers are endorsed in other commercial fisheries that may be subject to boat size and/or replacement

⁵ The minimum period used to be 4 weeks but changed to 48 hours on 5 February 2007 with the commencement of the *Fisheries Management (Supporting Plan) Regulation 2006*.

rules and maximum boat specifications may apply (refer to the FM (General) Regulation for further detail).

Under the OCS agreement, fishing boats that were previously licensed to fish outside 3 nm under Commonwealth jurisdiction were automatically issued an authority on their State boat licence (called an 'OG1' or an offshore general authorisation) to continue to work in offshore waters. Only boats that are licensed with an OG1 notation are currently permitted to operate in ocean waters beyond 3 nm.

4.4.1 Renewal of licences

Commercial fishing licences and fishing boat licences must currently be renewed annually or upon the expiry of the period specified on the licence. Fishers are sent renewal application forms approximately one month before the expiry date on the licence. If a licence expires and a new licence application is required, a higher application fee applies.

4.4.2 Voluntary suspension of fishing boat licences

The holders of a fishing boat licence can apply for the licence to be voluntarily suspended (previously known as abeyance), if no boat is attached to the licence (eg. if it is lost or destroyed). Fishing boat licence fees are payable during the period of voluntary suspension. The licence holder can apply at any time to attach a new boat to the licence provided the replacement boat falls within the maximum boat specifications specified on the licence.

4.5 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 the NSW DPI 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>

4.6 Code of practice

This FMS promotes the development of a code of practice for all lobster fishers, to encourage responsible fishing practices and to minimise the impact of lobster fishing on the environment (see management response 1.1(c)).

4.7 Time and area closures

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

- protect and conserve areas of key habitat
- manage the amount of fishing effort in a sensitive 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 (refer to management response 1.1(d)). Fishing closures are required to be published in the NSW Government Gazette, however, if the Minister for Primary Industries 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.

Details on up-to-date fishing closures that may apply to the Lobster Fishery can be found on the NSW DPI website at: <http://www.dpi.nsw.gov.au> or in the relevant share management plans once finalised.

4.8 Permits

Section 37 of the *Fisheries Management Act 1994* allows for permits to be issued for research and other authorised purposes. These permits provide a legal framework for activities that fall outside normal operating rules set out in the FM Act or its regulations. 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 issued under section 37 are valid only insofar as they do not conflict with approved determinations of native title made under the Commonwealth *Native Title Act 1993*. Permits are valid for the period specified on the permit, and may be suspended or cancelled at any time by the Minister. Permits are not transferable.

4.9 Reporting requirements

Lobster fishers are required to complete a rock lobster log sheet every day that they fish for rock lobster as well as a monthly reconciliation form that summarises the catch for every month. Non-fishing days are indicated on the monthly reconciliation.

Log sheets provide essential catch and effort information that is used for stock assessment purposes. These forms are periodically reviewed in consultation with the Lobster MAC to ensure that the data collected is sufficient for monitoring and assessment purposes (refer to management responses under Objective 7.3). They are also used as a compliance tool. Daily log sheets must be completed in accordance with the instructions provided on the sheet immediately after landing or transferring to a holding pen any rock lobster taken on that day, or immediately after returning to shore, if no lobsters were taken. These completed forms must be submitted to the NSW DPI within seven days of the particular fishing day. Information that must be recorded on the daily log sheet includes:

- area fished
- method
- number of traps pulled
- quantity of eastern rock lobster landed
- quantity of other lobster species landed
- quantity of eastern rock lobster discarded
- validated weight of landed lobsters
- holding pen location details
- tag numbers used
- crew and boat (if any) details

Lobster fishers must complete and forward to the NSW DPI a completed monthly reconciliation form within seven days of the end of each month. Information that must be recorded on the monthly reconciliation form includes:

- total daily catch
- reasons for non-lobster fishing days
- total catch for the month
- quota balance details
- disposal of catch information

Additional reporting requirements for the Lobster Fishery will be implemented to assist in identifying the fishery's interaction with threatened and protected species (management response 3.1(a)), recording all byproduct taken in the fishery (management response 2.3(d)) and recording loss of traps (management response 1.1(b)).

4.10 Tagging lobsters

Tags are attached to commercially caught lobsters to distinguish those lobsters taken legitimately by licensed commercial fishers. Tagging requirements only apply to the eastern rock lobster as it is the only species in the Lobster Fishery subject to a TACC. Lobster fishers are required to attach a tag to all eastern rock lobsters before they are transferred to another boat, placed into a holding pen or immediately after a rock lobster is landed and before entering any premises. Each tag is to be attached in a manner that it cannot be removed without being broken and the fisher is to trim the tail of the tag so that it is flush with the locking mechanism immediately after attaching it.

Tags are issued to shareholders or nominated fishers by the NSW DPI each fishing period in accordance with the quota allocated to the relevant shareholding. The number of tags issued to each fisher is calculated using the average weight of a retainable eastern rock lobster across the fishery. A lobster fisher can order additional tags as needed during the fishing period. All tags are registered with the Department and reconciled through mandatory catch reporting. Tags have a unique identification number and must be used in sequential order. Tags may not be re-used and must be produced when requested by a Fisheries Officer. A lobster fisher's tags are only transferable to another lobster fisher

in conjunction with an approved quota or share transfer. The NSW DPI must receive written advice of any lost, stolen or destroyed tags. Unused tags must be returned to the Department at the end of the fishing period.

4.11 Catch limits

A total allowable commercial catch is applied to eastern rock lobster. There are currently no direct catch limits for other species taken in the Lobster Fishery, although a limit on wobbegong sharks is proposed in management response 2.3(f)).

4.12 Seafood safety programs

Food safety programs which relate to the Lobster Fishery, are administered by the NSW Food Authority under the *Food Act 1989*. Food safety programs for all commercial fisheries are currently being prepared by the NSW Food Authority and will be supported under the FMS (see management response 5.3(a)).

5. Compliance

Fisheries Compliance Services aim to provide protection and ensure long term sustainability in the Lobster Fishery through an effective and cost efficient advisory and enforcement program consistent with the management arrangements for the fishery. The NSW DPI has approximately 100 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.

The large majority of these fisheries officers are located in coastal areas of NSW, including ports from which the Lobster Fishery operates. The general duties of these fisheries officers include conducting patrols, inspecting commercial and recreational fishers and fishing gear, and recording rates of compliance. Industry directly contributes to lobster compliance through funding a dedicated Fisheries Officer position.

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

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

The NSW DPI manages compliance service delivery for each significant fishing or target program through a district compliance planning process. Each district fisheries office is responsible for compliance service delivery within a geographical area, and develops a district plan based on the particular priorities associated with that area. These priorities vary throughout the State, may be determined by a focus of certain fishing activities in that area, and may also be driven by the existence of areas of importance, or sensitive habitat within that area.

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

The compliance objectives for the rock lobster resource are:

- to advise and educate the commercial, recreational and marketing sectors and the general public on the management rules and promote and encourage the sustainable use of the rock lobster resource;
- to maintain the integrity of the TACC;
- to maximise compliance with the management rules by all sectors and to apprehend and prosecute fishers involved in the illegal taking and/or selling of rock lobster.

Officers regularly inspect fishers endorsed in the Lobster Fishery in relation to size limits, logbook completion and to ensure compliance with the quota management system. In addition, officers regularly inspect the marketing, retail, and recreational sectors. Rewards (funded by management charges) of up to \$500 may be paid for information leading to a conviction for rock lobster related offences. Fisheries Officers have broad powers including the authority to board and search vessels and enter and search premises for fish, fishing gear or any records relating to the fishing activities of the boat. Fisheries Officers may also request a fisher to produce the appropriate fishing authority for the activities they are either undertaking, have undertaken or intend to undertake. Officers also have powers to seize various items connected with fisheries offences including fishing equipment, boats and motor vehicles.

The NSW DPI developed and implemented a statewide compliance operational plan for the Lobster Fishery in 1999. This plan is updated annually to implement efficient and effective compliance and advisory services for the rock lobster resource, consistent with the overarching statewide Compliance Plan for NSW. Table 5.1 outlines the various compliance plans relevant to the Lobster Fishery.

Table 5.1 Compliance plans relevant to the Lobster Fishery.

Plan	Description	Review period
NSW Compliance Plan	Overarching framework that identifies priorities and objectives for compliance throughout the State	Every three years
District compliance plans	Regionally focused day to day compliance work plans, varying in each district to ensure appropriate compliance coverage across all programs	Quarterly
Lobster Fishery Strategic Plan	Longer term compliance objectives and strategies specific to the commercial Lobster Fishery	Upon review of the Lobster Share Management Plan
Rock Lobster Statewide Operational Plan	A working plan for a specialised team of Fisheries officers implementing compliance services for the State's rock lobster resource (<i>i.e.</i> commercial and recreational compliance services)	Annually

5.1 Penalties

The FM Act provides for maximum penalties for individuals and corporations of 2000 penalty units, or 2 years imprisonment, or both.

A rock lobster offence is an offence against the FM (Lobster SMP) Regulation, the FM Act or the FM (General) Regulation relating to the taking of rock lobster. The FM (Lobster SMP) Regulation designates the contravention of provisions of the plan as shareholder offences and/or endorsement holder offences.

The Lobster Fishery has designated share forfeiture offences (see Table 5.2). If a shareholder or nominated fisher of a shareholder is convicted of a share forfeiture offence, the number of applicable demerit points is recorded against the name of the concerned shareholder. All shares held by the shareholder may be forfeited to the Minister for Primary Industries if the total number of demerit points accumulated reaches or exceeds six. Demerit points are not currently cancelled by the expiration of time. The share forfeiture scheme will be reviewed, and amended where appropriate, in response to the introduction of an endorsement suspension/share forfeiture scheme in other NSW share management fisheries (see management response 6.2(a)). Clause 139 of the FM (General) Regulation also provides for share forfeiture for failure to pay a community contribution or other amount due under the FM Act.

Table 5.2 Share forfeiture offences in the Lobster Fishery.

Share forfeiture offence	Description	Demerit points
Contravention of cl. 16 of Lobster SMP Regulation	Contravention of quota	2
Contravention of cl. 22 of Lobster SMP Regulation	Rock lobster to have tag attached	2
Contravention of cl. 48 of Lobster SMP Regulation	Daily log sheets	2
Contravention of cl. 49 of Lobster SMP Regulation	Monthly reconciliation	2
Contravention of cl. 107 of Lobster SMP Regulation	Interference with set fishing gear	3
Any offence under the FM Act or Regulation that is punishable by imprisonment		3

6. Research

6.1 Strategic research plan

The NSW DPI has developed a strategic research plan covering priorities across all fisheries which is responsive and takes account of the research requirements identified under each FMS. Table 6.1 summarises the research priorities for the Lobster Fishery. It includes a description of each of the ongoing research initiatives related to the management of the fishery as well as new initiatives identified in section 9 of this FMS to address knowledge gaps highlighted by the environmental risk assessment for the fishery.

Various research projects contribute to the annual resource assessment that is provided to the TAC Committee to assist with the determination of the TACC for the fishery (e.g. Liggins *et al.*, 2000-2006). These projects are conducted on an ongoing basis while others may occur periodically or as needed. The Lobster MAC assigns priority to research needs on an annual basis taking into account the annual budget and research requirements recommended by the NSW DPI and priorities identified in this FMS. While applications are submitted for external funding, lobster shareholders fund the majority of the research conducted for the fishery.

6.2 Review and assessment of the dynamics and status of the fishery

The TACC of eastern rock lobster is set by the TAC Committee prior to the beginning of each season (financial year). It is set having regard for any review and assessment of the dynamics and status of the Lobster Fishery following the previous season. An annual report for the Fishery, an annual assessment of eastern rock lobster and the NSW DPI's submission to the TAC Committee are all considered by the TAC Committee when reviewing the TACC.

An assessment of the NSW eastern rock lobster resource is completed annually and published in the NSW Fisheries Resource Assessment Series. The assessment includes reviewing all current monitoring programs that apply to the Lobster Fishery and applying data to both biomass dynamics and length-structured models. It provides the current status of the stock, based on both models.

The NSW DPI provides a submission to the TAC Committee each year for consideration when determining the TACC for the Lobster Fishery. The submission summarises the performance of the fishery in relation to the goals of the fishery. It includes information relating to research, compliance and management activities during the previous season (ie. financial year period), data on commercial catch and information on share and quota trading. Key points for consideration by the TAC Committee are presented at the beginning of each submission from the NSW DPI.

Meetings with representatives from the Lobster MAC, the NSW DPI fisheries research, fisheries management and fisheries compliance and other stakeholders are conducted annually to discuss the current status of the fishery, stock assessment data, compliance and other social and economic factors that may impact on the fishery taking the TACC.

Table 6.1 Research priorities in the Lobster Fishery at the commencement of the FMS.

Research Project	Priority	Aims & comments	Related mgt responses
Biological Research			
Logbook program and analysis of catch and effort data from the Lobster Fishery	High	Provide information about catch, effort and CPUE and their spatial (by latitude & depth) and temporal (by months, seasons, and years) variation. This fishery-dependent data provides the "reported annual commercial catch" and the basis for an index of abundance for the biomass dynamic and length-structured models used for the eastern rock lobster stock assessment. It provides estimates of the numbers of rock lobsters caught and released (under minimum size, over maximum size, berried females). It will also provide information about catches of byproduct species and interactions with protected or threatened species and information on trap loss.	2.1(d)
Observer-based survey of the size-structure of rock lobsters taken by the fishery	High	Provide information about the sizes (and maturity) of rock lobsters and their spatial (by latitude and depth) and temporal (by seasons and years) variation. This fishery-dependent data provides annual estimates of the size-distribution of the commercial catch that are used to fit the length-structured stock assessment model. This survey will be repeated periodically.	2.1(e)
Monitoring program (observer-based) to survey the magnitude and species composition of byproduct and bycatch	High	Provide information about the magnitude and species-composition of byproduct and bycatch in the commercial fishery (including spatial and temporal variation). The initial data-collection component of this survey was completed over 3 years (1999 to 2002) in conjunction with the observer survey for size structure of rock lobster. The monitoring program, incorporated in the observer program and commencing within 18 months, will periodically collect magnitude and species-composition information on byproduct and bycatch. The program will also collect biological information about elasmobranch species taken by the fishery, including wobbegong sharks.	1.2(b), 2.3(e)
Survey of puerulus recruitment to nearshore waters. Investigation of relationship between puerulus abundance and subsequent recruitment to the eastern rock lobster population	High	Provide estimates of puerulus recruitment, determine whether estimates are predictive of the abundance of legal-sized lobsters in future years (medium term), and examine the relationship between recruitment and the size of the mature stock (long term). This fishery-independent work has been conducted each year since 1995-96 and provides a measure of change in recruitment over time. If a relationship between the abundance of pueruli and subsequent recruitment into the fishery is established, this survey will provide a means of forecasting (2-3 years in advance) abundance of lobsters entering the fishery.	2.1(f)
Fishery-independent survey of abundances of mature eastern rock lobsters	High	Monitor abundance and size-composition of the spawning stock of eastern rock lobsters. Initially, experiments were done to determine a trap design that would maximise the catch of mature lobsters (1998-99, 1999-00, 2000-01). Using the standard trap design, the survey has been repeated in 2001-02, 2002-03 and 2003-04. Repeats of this survey (frequency to be determined) will provide fishery-independent estimates of the relative change in abundance of the mature stock over time and comparison with fishery-dependent indices.	2.1(g)

Further development of the fishery-independent survey of abundances of mature lobsters	Medium	To determine whether the abundances and size-distributions of lobsters at the existing sites are representative of the abundances and size-distributions of lobsters in the spawning stock. The fishery-independent survey of the abundances of mature eastern rock lobsters (1998-99 to 2002-03) has shown a decline in the abundance of spawning stock. The survey is done between September and December each year at 2 sites at each of 4 locations on the north coast of NSW (depth range approximately 10-20 m). This project will consider the cost-benefit of including additional survey sites/locations: i) within the 10-30 m depth stratum (as for existing survey); ii) in depths greater than 30m (a major expansion of the survey).	2.1(g)
Tagging program and analysis of lobster growth and movement	High	Estimate rates of growth of lobsters (across the size-range); estimate rates of movement of lobsters (south to north migration, inshore-offshore movements). Reduced tagging since 2001-02 (opportunistic tagging of large mature lobsters only). Recapture component of program ongoing.	-
Annual stock assessment and ongoing development of biomass dynamics and length-structured models	High	Develop models of the eastern rock lobster population and fishery that can be used to assess changes in stock biomass over time and provide a risk assessment of alternative management strategies (alternative TACs in particular). Provide an annual assessment of the stock to the TAC Committee (incorporating the modelling and information from various research programs). Biomass dynamic and length-structured models of the lobster population and fishery have been developed and are updated annually. These models provide estimates of changes in biomass of the population over the history of the fishery and make predictions about likely changes in biomass that would result from alternative harvest strategies (TACs in particular).	2.1(b) & (c)
Estimates of recreational and Indigenous catch of eastern rock lobster	High	Refine estimates of the annual catch of rock lobsters by recreational fishers (including Indigenous catch) in NSW for use in stock assessment models and reports to the TAC Committee. Review of existing information from previous recreational and indigenous fishing surveys and ongoing revision as new information becomes available.	4.1(a)
Estimates of illegal rock lobster catch, including surveys of the unreported component of commercial rock lobster catch	High	Refine estimates of the annual illegal catch of rock lobster in NSW for use in stock assessment models and reports to the TAC Committee. Information on illegal catch will come from surveys of commercial fishers and fish receivers, and from the results of compliance actions.	4.1(a)
Investigation of the mortality on undersize lobsters resulting from capture and discard and the use of escape panels to minimise the quantity of under-sized lobsters captured	Medium	Investigate the use of escape panels in waters less than 10 m depth. A large number of under-sized lobsters are caught and released annually in inshore waters. Although there is some basis for believing that subsequent mortality is not likely to be significant, this needs to be established. Escape panels may reduce the unwanted capture of under-sized lobsters. In addition to reducing the mortality from capture and subsequent discarding, this may also reduce black-marketing of under-sized lobsters.	1.2(a)

Investigations of the impacts of trap loss on mortality of lobsters and other species (ghost fishing)	High	Collect information on trap loss (via the logbook), the time for lobster traps to breakdown (such that lobsters can escape), survival times for lobsters in traps, estimate consequent mortality associated with 'ghost fishing' in the Lobster Fishery, and thus determine whether lobster fishing methods need to be modified. Research into the potential impacts of trap loss on mortality of lobster and other species is underway. Initial results show that ghost fishing may be a significant source of lobster mortality. Further research is necessary to both confirm these results and identify appropriate and effective mechanisms to mitigate the impacts of trap loss.	1.1(b)
Investigations of the impacts lobster fishing on hermit crab populations.	Low	Collect information on the catching, discarding and translocation of hermit crabs in order to assess the impacts on and risks to, hermit crab populations. This industry funded study (activated by a 30 tonne catch trigger, or conducted earlier if desired by LobMAC) will allow assessment of the need for any further research and/or the introduction of mitigative management arrangements to ensure that the future operation of the Lobster Fishery does not pose an undue risk to hermit crab populations.	2.3(d)
Socio-economic research			
Identification of opportunities for enhancing the market (increasing demand and price) for eastern rock lobsters	Medium	Identify and promote harvest and post-harvest practices that ensure the best return for the produce of the fishery. Maximising return is important for lobster fishers' profitability and ability to absorb the costs of fishing.	5.1(d)
Economic and social survey of lobster shareholders	High	Economic survey to determine the economic viability of lobster shareholders. Previous studies of the economic viability of lobster operators relied on the results of a survey of a sample of fishing businesses for the 1999-00 financial year. Further surveys are required to provide updated information in the future. Among other things, this study will assist in refining the performance indicator for monitoring trends in the commercial viability of fishing businesses and include assessing the effects (costs and benefits) of external (eg. illegal activity) and internal (eg. industry restructuring) factors.	5.1(e) & (g)
Investigation of the data available to assess the economic multiplier effects of commercial fishing, including the Lobster Fishery	Medium	To investigate the flow-on (or multiplier) effects of the lobster fishery to the broader community and develop strategies to improve the quality/usefulness of such data. Currently, only limited data are available on the flow-on economic effects from the Lobster Fishery, which includes not only the direct employment, income and expenditure generated by participants in the fishery, but also those benefits indirectly generated as a result of inputs and other ancillary services provided to the lobster fishing fleet. Study of flow-on effects should be undertaken at the regional level and would ideally be linked with regional economic assessments.	5.1(f)

7. Consultation

A number of consultative bodies are established in NSW to assist and advise the Minister for Primary Industries and the NSW DPI 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.

7.1 The Management Advisory Committee

Share management fisheries in NSW each have a Management Advisory Committee (MAC) that provides advice to the Minister for Primary Industries 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.

The actual composition and role of management advisory committees is set by the FM Act and its regulations and may be altered from time to time. The Act currently provides for four industry positions on the Lobster MAC (including representation from the north and south coast of NSW), a conservation position, a recreational fishing position, a NSW DPI representative and an Indigenous position. The MAC is to be chaired by an independent person who is not engaged in commercial fishing and is not engaged in the administration of the FM Act.

The industry members of the MAC comprise representatives that are elected by shareholders 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 Primary Industries and also hold terms of office of up to three years. The number of non-elected members in the MAC must be less than the number of elected members. At least two meetings are to be held each year, unless otherwise determined by the MAC. Although the MAC receives advice from the NSW DPI 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.

7.2 Ministerial advisory councils

Two 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 Primary Industries, or on any other matters the councils consider relevant. They report directly to the Minister for Primary Industries.

The wild harvest fishery related Ministerial advisory councils in place at the commencement of the FMS are:

- Seafood Industry Advisory Council (SIAC)
- Advisory Council on Recreational Fishing (ACoRF)

The Lobster Fishery and each of the other major share management fisheries have representatives on the SIAC. These representatives are nominated by each of the respective management advisory committees and appointed by the Minister for Primary Industries.

A “Discussion paper on the advisory structures in the NSW seafood industry” was distributed to industry in December 2003 and resulted in changes to the then existing advisory structure, which comprised of ACoRF, the Advisory Council on Commercial Fishing (ACCF) and the Advisory Council on Aquaculture (ACoA): the latter two were amalgamated to create SIAC. The name and composition of ministerial advisory councils are determined by regulations under the FM Act, and may be altered from time to time.

8. Interactions with other fisheries

The main interaction in terms of competition for the eastern rock lobster resource in NSW is with the recreational fishery. The Lobster Fishery also interacts with other commercial fisheries where lobster traps are set in the same areas as other commercial fishing gears (such as setlines, tuna long lines, fish traps and trawl nets).

8.1 NSW commercial fisheries

No other commercial fisheries in NSW are permitted to land rock lobster. Fishers who are not endorsed to operate in the Lobster Fishery but catch lobsters as bycatch in other commercial fisheries, must return the animals to the water. There are some species, however, that are taken as either byproduct (i.e. not targeted but retained) or bycatch (i.e. discarded) in the Lobster Fishery. These species, such as redfish, may be taken or even targeted, by other NSW commercial fisheries.

Most lobster fishers (around 90%) are also endorsed in other NSW commercial fisheries (NSW DPI fisheries licensing database, 2002). Of the 147 lobster fishers actively participating in the Lobster Fishery in 2001-02, 35% participated in the Lobster Fishery only and the remaining 65% also participated in other NSW commercial fisheries. When they did so, the other fisheries involved were mainly the Ocean Trap & Line, Estuary General and Ocean Hauling fisheries. The percentage of lobster fishers who participated in multiple fisheries are as follows:

- 37% participated in two fisheries
- 21% participated in three fisheries
- 7% participated in four fisheries.

Although there is some conflict between commercial fishing sectors in NSW, the interaction of fishers participating in more than one fishery possibly reduces the level of conflict that may be expected if each fisher participated in one fishery only. The diverse operations of many commercial fishers in NSW means that most fishers have an understanding of the issues affecting each other and the industry as a whole.

Mullet and luderick are commonly used bait species in the Lobster Fishery, with most of these fish supplied by the estuary general and ocean hauling fisheries. A smaller proportion of bait is imported from other states (in particular tuna frames used as bait offshore).

8.1.1 Ocean Trap and Line Fishery

The Ocean Trap and Line Fishery targets finfish species with bottom set fish traps and a variety of lining methods in offshore areas where the Lobster Fishery also operates. The fish trapping component of the Ocean Trap and Line Fishery has a similar operation to lobster trapping.

Approximately 49% of fishers operating in the Lobster Fishery also fish in the Ocean Trap and Line Fishery (2001/02 data). These are mainly fishers who have been endorsed in the two fisheries since before the commencement of the lobster share management plan and have lobster trapping and demersal fish trapping history.

8.1.2 Estuary General Fishery

Approximately 25% of fishers operating in the Lobster Fishery also fish in the Estuary General Fishery (2001/02 data). The Estuary General Fishery does not directly interact with the Lobster Fishery. However, lobster fishers who are also endorsed to operate estuary hauling or meshing nets may gather species such as mullet and luderick to bait their lobster traps.

8.1.3 Ocean Hauling Fishery

Approximately 17% of fishers operating in the Lobster Fishery also fish in the Ocean Hauling Fishery (2001/02 data). Fishers endorsed in both of these fisheries have the ability to take fish, such as mullet and luderick under an ocean hauling endorsement for use in their lobster traps. Direct interaction between ocean hauling activities and lobster trapping are thought to be low.

8.1.4 Other NSW commercial fisheries

Two lobster fishers also participate in the Abalone Fishery (2001/02 data). Abalone and rock lobsters share habitat in shallow reef environments. As there is a modest increase in the number of fishers diving to take lobsters commercially, there is an increasing potential for interactions between these two fisheries to occur. The possibility of interactions between abalone and lobster fisheries is heightened on the south coast where commercial abalone divers and lobster divers are sharing fishing areas.

NSW trawlers sometimes catch lobsters in their trawl nets, entangle and cut off lobster traps, remove lobsters from traps and damage lobster habitat with trawl gear, causing costs to the Lobster Fishery.

8.2 Lobster fisheries in other states

The Queensland east coast lobster fishery consists mostly of one species of tropical spiny rock lobster (*Panulirus ornatus*) taken exclusively by diving (mainly using 'hookah' equipment). This commercial fishery operates from Cape York to 14° south latitude (north of Cape Melville) with over 90% of catch taken for the export market. Eastern rock lobster (*Jasus verreauxi*) is not taken by the Queensland fishery.

Eastern rock lobsters comprise a minor incidental catch in the southern rock lobster fisheries off Tasmania, Victoria and South Australia. The NSW Lobster Fishery takes a small amount of southern rock lobster (*Jasus edwardsii*) from the waters off the south coast of NSW. Southern rock lobster comprises less than 1% of total NSW commercial rock lobster catch.

8.3 Commonwealth fisheries

8.3.1 Offshore Constitutional Settlement (OCS)

The Offshore Constitutional Settlement (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 1990 that defines jurisdiction over specific fisheries by area, species and gear type. This OCS is still binding and covers waters outside 3 nm. The Commonwealth retains jurisdiction over tuna and billfish species by the main commercial methods in all offshore waters (outside 3 nm) and over the major trawl species 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 about 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 arrangements.

8.3.2 Eastern Billfish and Tuna Fishery

Changes in the management of the Eastern Billfish and Tuna Fishery have led to increased interaction between tuna long-liners and the Lobster Fishery in the north of the state. The season for tuna long-lining and lobster trapping in deep water coincides. Lobster fishers are concerned about the loss of lobster traps due to float lines being tangled or severed by the long lines (TAC Committee 2002). Meetings have been held between representatives of lobster and tuna long line fishers to discuss gear conflict over recent years. Notices and maps have been distributed indicating main lobster fishing grounds on the mid-north coast and periods when lobster gear is set in the area of interaction.

8.3.3 South East Scalefish and Shark Fishery

The offshore component of the Lobster Fishery interacts with the South East Scalefish and Shark Fishery. These fish trawlers sometimes catch lobsters in their trawl nets, entangle and cut off lobster traps and damage habitat with heavy bobbin gear, causing costs to the Lobster Fishery. Meetings have taken place over time between lobster and trawler operators to help resolve gear interaction.

8.4 Recreational Fishery

The recreational fishery includes diving and trapping for lobsters. Diving is permitted without the use of underwater breathing apparatus. Recreational fishers are restricted to the use of one marked trap in a depth of 10 m or less.

Recreational fishers were restricted to one trap in 1936 and to a daily limit of five lobsters in 1968. In 1993, recreational fishers were restricted to the existing daily bag limit (and possession limit) of two rock lobsters. Recreational fishers must also adhere to the eastern rock lobster minimum and maximum size limits of 104 mm and 200 mm (respectively) and must return lobsters carrying eggs to the water.

Recreational lobster fishers are required to hold a recreational fishing fee receipt (known as a recreational fishing licence). There are currently no tagging or tail clipping requirements for lobsters taken for recreational purposes in NSW.

The recreational fishery interacts with the Lobster Fishery because the same stock is harvested by both groups. In particular, competition for rock lobsters occurs in inshore areas where the activities of commercial and recreational lobster fishers overlap. Lobster traps used by commercial and recreational fishers (and any lobsters therein) are prone to theft as they are generally left unattended.

A 12 month survey of recreational fishing in NSW was conducted in 2000-2001 as part of the National Recreational and Indigenous Fishing Survey. An interim report by NSW Fisheries (now NSW DPI) estimates the annual quantity of lobster taken by recreational anglers in NSW to be 7.4 t. The accuracy of this estimate is questionable, given that only nine households were identified as harvesters of lobster in this survey. The TAC Committee assumes a recreational catch of 25.8 t when determining the TACC for the Lobster Fishery, based on an earlier survey of recreational fishers concentrated on the south coast of NSW by Andrew *et al.* (1997). The TAC Committee acknowledges the need for a more detailed analysis of alternative estimates of recreational catch (TAC Committee, 2003) and research proposals are in preparation.

8.5 Indigenous fishing

Fishing for rock lobster is an element in the culture of coastal communities of the Aboriginal people of south eastern Australia. Schnierer and Faulkner (2002) report that lobster species are targeted by Indigenous communities in all coastal regions of NSW. In 1997, NSW Fisheries (now NSW DPI) conducted a small survey on Aboriginal coastal fishing. The survey showed that Indigenous people fished regularly and that they often fished to feed large or extended families. When certain circumstances exist, the Minister for Primary Industries may issue a permit under the *Fisheries Management Act 1994* that authorises Indigenous people to meet specific cultural obligations with respect to traditional fishing. This may include exceeding the recreational daily bag limit of two rock lobsters per person.

The exact number of Aboriginal people directly involved in commercial lobster fishing is not presently known. While there is provision for Indigenous representation on the Lobster MAC, an Indigenous representative has not been nominated.

Further information on the interaction of the Lobster Fishery with Indigenous fishing can be found in the Lobster Fishery EIS (see Volume 3 Appendix B3).

9. Goals, Objectives and Management Responses

This section sets out the long term goals, objectives and management responses for the Lobster Fishery that have been developed in order to achieve the vision for the fishery.

9.1 A model framework



Figure 9.1 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 9.1. The reality is that management responses contribute toward achieving more than one goal.

For example, a fishing closure, implemented to reduce conflict between resource users, 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 9.2).

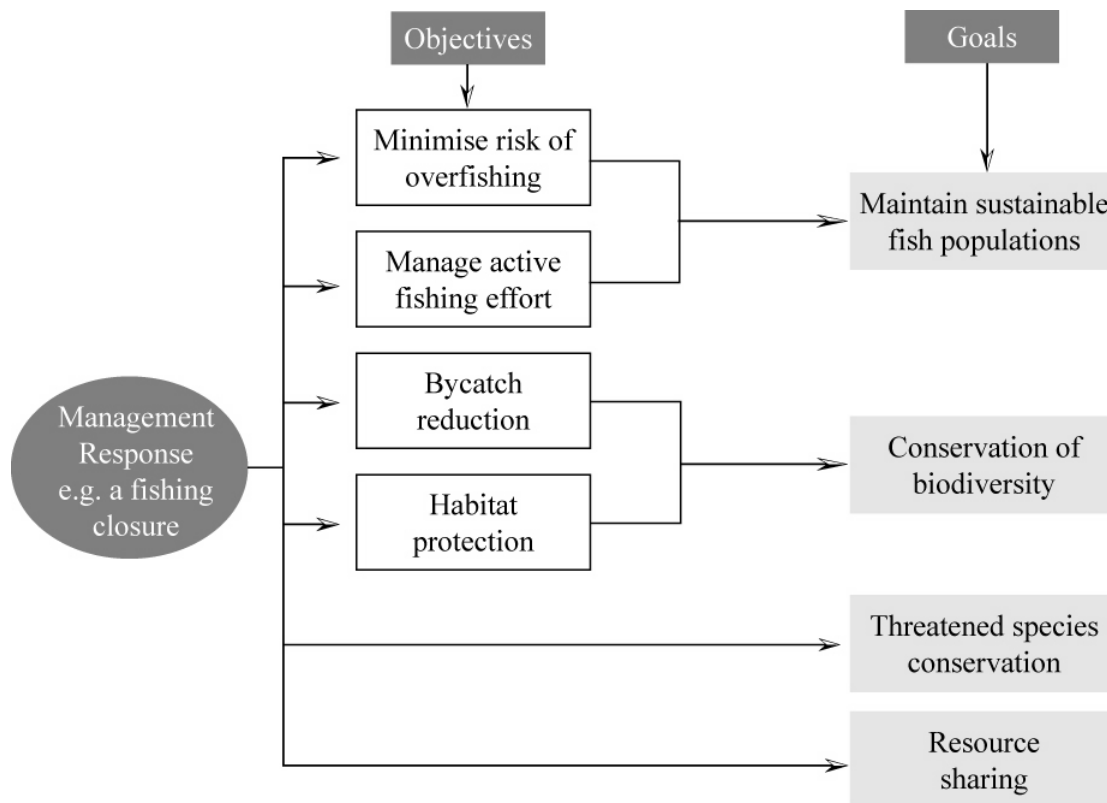


Figure 9.2 An example of how a single management response affects multiple goals and objectives.

This complex structure has been dealt with in the following section by listing each of the management responses once only, under the objective that the response contributes most towards achieving. Management responses with an asterisk (*) indicate new management actions that are to be implemented to address, *inter alia*, the outcomes of the EIS risk assessment on the existing operation of the fishery.

Information relating to the implementation of management responses is provided in a table located in Appendix 1. The implementation table outlines the time periods within which each management response is scheduled to be implemented, as well as information relating to the head of power for implementation and the group who has the lead responsibility for carrying out the actions.

The management responses listed in the following section relate to specific actions that directly contribute to meeting the goals and associated objectives defined for the Lobster Fishery. The overall management regime for the Lobster Fishery includes the management responses (below), the principles and guidelines contained within the harvest strategy (see section 3 of this FMS), as well as the general requirements of the FM Act and associated regulations.

9.2 Goals, objectives and management responses

GOAL 1. Manage the Lobster Fishery in a manner that promotes the conservation of biological diversity in the marine environment

Objective 1.1 Mitigate the impact of lobster fishing on ecosystem integrity (species, populations and ecological communities)

1.1(a) Prohibit commercial lobster fishers from taking species other than species of rock lobster in waters less than 10 m in depth

*Background: Although the initial purpose of this restriction was to reduce conflict between the Ocean Trap and Line Fishery and the Lobster Fishery, it also works to minimise the impact of this fishery on species other than rock lobster. The Lobster Fishery is a highly targeted fishery, focusing on taking eastern rock lobster, *Jasus verreauxi*. Occasionally, other rock lobster species, such as the southern rock lobster, *Jasus edwardsii*, or the tropical rock lobster, *Panulirus spp.* are taken in lobster traps and may be kept by lobster fishers. It is thought that there is minimal catch, other than rock lobster species, taken by the inshore lobster traps, with little mortality to discarded catches in the shallower depths. However, there may be more species taken in offshore traps set at considerably greater depths and higher mortality of discarded species once pulled from the bottom. As such, this restriction has been more practical for inshore traps. To assist in reducing conflict, and prevent shifts in targeting in offshore waters, traps set outside 10 m depth contour have been required to discard any species of a “prohibited size class”⁶ but may retain other species. A byproduct species list now applies to lobster traps set outside the 10 m depth contour (see management response 2.3a). Continuing to restrict lobster trappers to only taking rock lobster species in depths less than 10m ensures the inshore component of the fishery remains highly targeted and prevents any future shifts in fishing effort away from rock lobsters.*

***1.1(b) Collect information on the number of traps in the fishery that are lost during fishing operations, and implement appropriate management actions that mitigate the risks of ghost fishing, as required**

Background: The quantity of traps that are lost each season due to various reasons such as, weather, ocean currents, entanglement with gear used in other fisheries, ships breaking head gear etc is unknown. In order to determine the numbers of traps lost, and ultimately whether there is any potential risk of ‘ghost fishing’ from lost lobster traps, the catch reporting system will collect data on the number of traps. This information would be recorded by fishers as losses occur and collected at the end of each trapping season. ‘Ghost fishing’ is the term given when an item of fishing gear is unable to be retrieved and continues to have the ability to capture or entangle animals.

⁶ “Prohibited size class” of fish is any species with a minimum size limit specified in the *Fisheries Management (General) Regulation 2002*.

Research into the potential impacts of trap loss on mortality of lobster and other species is underway. Initial results show that ghost fishing may be a significant source of lobster mortality. Further research is necessary to both confirm these results and identify appropriate and effective mechanisms to mitigate the impacts of trap loss. The scientific observer program will also be used to provide information on trap loss.

- *1.1(c) Develop a code of practice for the Lobster Fishery in consultation with the Lobster MAC that is consistent, where appropriate, with the code of practice for the Ocean Trap and Line Fishery, including promoting the release of wobbegong sharks that are below 130 cm in length that are caught in lobster traps.

Background: The code of practice for the Lobster Fishery will be developed and periodically reviewed by the NSW DPI in consultation with the Lobster MAC. It may address issues such as best practice techniques in disposal of wastes, handling and returning bycatch, use of gear, banning the use of 'callers' (rock lobsters left or placed in a trap when set to attract other rock lobsters), disposal of gear, and operating in the vicinity of other water users and known threatened species, populations and ecological communities.

As the code of practice may be developed for a multitude of purposes it may have both enforceable and voluntary components. The requirement to adhere to relevant parts of the code of practice should be added to the share management plan and compliance with the code will be reported through monitoring compliance levels. An example of conduct rules could be to minimise the growth on buoys (by cleaning) to prevent the inadvertent capture of sea turtles that may get tangled in ropes whilst trying to feed on organisms settled on buoys.

Research is underway into the life history of wobbegong sharks. However, it is recognised that specific and immediate action should be taken to reduce the risks to wobbegong sharks. It is desirable that wobbegongs caught in lobster traps and that are smaller than 130 cm total length be released as an interim measure pending the outcome of the review of research and other management arrangements for wobbegong sharks proposed under the Ocean Trap and Line Fishery FMS.

The code of practice will be developed in a way that recognises differences in operations between inshore and offshore and between the northern and southern regions of NSW waters. To ensure the guidelines contained in the code of practice are adhered to (particularly where voluntary) and that the guidelines remain appropriate for the operation of the fishery, an ongoing review and update by the Lobster MAC will be undertaken.

- 1.1(d) Use fishing closures to control fishing activities within the Lobster Fishery

Background: This is an adaptive provision of the strategy to allow the modification of fishing practices from time to time. The response itself does not require any immediate action upon implementation of the FMS.

Fishing closures may be used to protect key fish habitat and minimise impact on sensitive ocean habitat, avoid direct interactions with marine and terrestrial threatened species, populations or ecological communities, equitably share the resource between lobster fishers and other stakeholders or minimise conflict between resource users.

Fishing closures may be gear specific, so that only the relevant gear type/s are affected by such a closure. Closures are periodically reviewed and modified to take account of changing fishing

patterns and/or environmental conditions. Any new fishing closures should take account of areas closed to lobster fishing through marine protected areas.

Fishing closures prohibit fishing over an area either absolutely or conditionally. In this FMS 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.

- *1.1(e) Map major lobster fishing grounds (including available information on associated geological features), assess the level of lobster fishing on each ground and define the areas in NSW waters open to lobster fishing (taking account of marine protected areas)

Background: As major lobster fishing grounds are identified, their general location will be entered on maps. The maps will include available information of any relevant geographical features, and also provide information on the level of lobster fishing that occurs in each area (taking into account seasonal variations, where known). Trap setting details such as latitude (by grid), distance from shore and depth are already reported by fishers on a daily basis and will assist in mapping lobster fishing grounds.

The purpose of the maps is to graphically demonstrate the areas where lobster fishing currently occurs and does not occur, and therefore where ecosystem integrity is sheltered from the impacts of lobster fishing. The maps will also assist in managing cross-fishery interactions with commercial and recreational line fishing methods, ocean trawling activities and fish trapping activities as foreshadowed under Goal 4. Information on the key fishing areas and habitats will be sought from fishers within three years of approval of the FMS.

Objective 1.2 Mitigate the impact of lobster fishing activities on non-retained species

- *1.2(a) Investigate the use of escape gaps in lobster traps to minimise the quantity of undersize lobsters captured, and implement the outcome of the investigation

Background: Escape gaps in lobster traps have been introduced in a number of Australian States to reduce bycatch. There is currently a moratorium on escape gaps in lobster traps used in less than 10 m depth in NSW until a research plan evaluates their value and effectiveness (FM (Lobster SMP) Regulation). In their assessment of the Lobster Fishery, DEH noted that the potential of escape gaps to reduce sources of injury, mortality and illegal take warrants immediate attention and recommended that NSW DPI, within two years, reviews current gear specifications and institute research to determine the optimum dimensions of lobster escape gaps and assess the benefits in terms of reduced catches of undersized lobster. Under this response, escape gap research will commence within two years of adoption of the FMS and will investigate the feasibility of various escape gap designs in reducing capture of undersize lobsters, gap dimensions and selectivity, gap positioning and the impacts of various trap types. If the research demonstrates that escape gaps are effective at reducing the incidental fishing mortality of undersize lobsters, appropriate measures will be implemented (within 18 months of completion of the research and in consultation with the LobMAC), in traps set at a depth range

that is appropriate to both the outcomes of the research and the practical operation of the fishery⁷.

1.2(b) Implement a monitoring program to collect information on the quantity and composition of bycatch

Background: Bycatch monitoring has been undertaken as part of the observer survey in the Lobster Fishery since 1999. Bycatch (and byproduct) information has been collected in conjunction with information on size composition of eastern rock lobsters in commercial catches. It is a recommendation of the Department of Environment and Heritage Lobster Fishery assessment that bycatch monitoring arrangements that are sufficient to enable detection of changes in the quantity and composition of bycatch over time be developed. The periodic observer program has and will, assist in examining the direct impact of the Lobster Fishery on bycatch and may assist in identifying whether any new studies are needed to determine the impact of the Lobster Fishery on the general environment. The monitoring program, incorporated in the observer program and commencing within 18 months, will periodically collect magnitude and species-composition information on byproduct and bycatch. The Lobster MAC has supported the inclusion of this additional information requirement into the observer survey. The design of the program will also take account of the need to collect additional biological information about elasmobranch species taken by the fishery, including wobbegong sharks (see management response 2.3(e)).

1.2(c) 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 (including threatened species populations)

Background: The National Policy on Fisheries Bycatch provides a national framework for coordinating efforts to reduce bycatch. It provides options by which each jurisdiction can manage bycatch according to its situation in a nationally coherent and consistent manner. If the methods of lobster trapping or skindiving are found to be having detrimental impacts on juvenile fish or on threatened species etc., the method's use should be modified so as to avoid or minimise those impacts (an example of this is the investigation of the use of escape panels in traps; management response 1.2(e)). Any changes to fishing practice that transpire under this management response could be implemented through conditions on the relevant fishing endorsement, through a code of practice or other regulatory control, depending on the nature of the change.

*1.2(d) Use best-practice handling techniques, including the prohibition on the use of fish spikes, clubs or any other such implement that could unduly harm non-retained organisms

Background: Some techniques used to return unwanted animals to the water unduly injure animals. Such techniques are used to hasten the sorting process or to avoid handling dangerous animals. Lobster fishers may occasionally use a "spike" to remove unwanted catch from the boat. A spike generally consists of a piece of timber with a nail through it and is used by piercing incidental catch and flicking it overboard.

⁷ Preliminary research data indicates that about 70% of undersize lobster would be protected from capture by escape gaps set in traps <10 m, 90% in <20 m and 99% in <30 m.

Under this FMS the use of spikes on fish to be discarded will be prohibited and fishers will need to adopt alternative techniques for returning animals to the water which avoid injuring those animals, taking into account occupational health and safety issues. In 1999, Ocean Watch (a non-profit company sponsored by the NSW seafood industry) produced a publication outlining bycatch solutions for non-trawl fisheries proposing better handling techniques. The prohibition of spikes and clubs is a specific action. The use of best handling techniques is an ongoing aim for the fishery.

- *1.2(e) Investigate the use of fish escape panels in lobster traps set in waters deeper than 10 m with a minimum mesh size no smaller than the mesh size adopted in the Ocean Trap and Line Fishery to minimise bycatch and the retention of juvenile and small fish, and implement the outcome of the investigation

Background: A FRDC funded study into the mesh selectivity of fish traps used in New South Wales (Stewart & Ferrell 2001) found that the selectivity of 50 mm hexagonal wire mesh was inappropriate for some important commercial fish species with minimum legal size limits that can be caught in the fishery (e.g. silver trevally). In it's assessment of the Lobster Fishery, DEH noted that the use of escape panels would provide for ongoing minimisation of impacts on non-target species and recommended that NSW DPI, within two years, reviews current gear specifications and institute research to determine the optimum dimensions of fish escape panels and assess the benefits in terms of reduced bycatch. Under this response, the appropriateness of escape panels in lobster traps, with a minimum mesh size consistent, as far as operationally practicable, with the minimum mesh size proposed for the Ocean Trap and Line Fishery, will be investigated. Investigations will also include an assessment of whether landings of legal size lobsters would be compromised by fish escape panels in lobster traps⁸. Escape panels of an appropriate mesh size will be implemented (within 18 months of completion of the research) if they are found to be effective in minimising bycatch and the retention of juvenile and small fish without unduly increasing the escape rate of legal size lobster from traps.

Objective 1.3 Mitigate the impact of activities within the fishery on marine and terrestrial habitat and their associated biota

- 1.3(a) Modify the use of lobster fishing methods in areas where their use is identified as having a detrimental impact on fish habitat or associated biota

Background: While the impact of the Lobster Fishery on fish habitat is thought to be low, a management response is needed to reduce any unacceptable impacts should they be identified or occur in the future. Management response 1.2c is closely related to this response, focusing on minimising the impact of the fishery on bycatch species (including threatened species populations). Where the methods of lobster trapping or skindiving are known to be having detrimental impacts on habitat, the method's use should be modified so as to avoid or minimise those impacts. These impacts may be identified through research programs in this FMS or through consultation with the Lobster MAC or ministerial advisory councils.

⁸ Previous research into fish escape panels in ocean fish traps focused on quantifying the loss of other finfish species and did not examine the impact on catches of lobster.

Objective 1.4 Prevent the introduction and translocation of marine pests and diseases by lobster fishing activities

- 1.4(a) Implement, in consultation with the Lobster MAC, measures required in accordance with any marine pest or disease management plans

Background: The Minister for Primary Industries or other authorities may alter management arrangements from time to time to minimise or mitigate the impact of marine pests and diseases. Recent examples of outbreaks were the suspected incidence of white spot disease in NSW prawns and the mass mortality of pilchards across southern Australia, during which a system of closures and monitoring was implemented in NSW.

At times it may be a requirement for the commercial fishing industry to respond to outbreaks by modifying fishing practices. Proposed measures will be discussed with the Lobster MAC prior to implementation.

GOAL 2. Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery

Objective 2.1 Maintain the spawning biomass of eastern rock lobster at or above 25 percent of pre-exploitation level

- 2.1(a) The TAC Committee will determine the maximum weight of eastern rock lobster to be taken by the commercial Lobster Fishery

Background: The Lobster Fishery is primarily managed by a quota management system as a means of controlling the output (catch) from the fishery. A total allowable commercial catch (TACC) of eastern rock lobster is set each year by the statutory and independent Total Allowable Catch Setting and Review Committee (TAC Committee). The TAC Committee was established under the FM Act and is to give effect to the objectives of the FM Act when determining any total allowable catches. In determining the TACC, the TAC Committee is required to have regard to all relevant scientific, industry community, social and economic factors impacting on the fishery. The TAC Committee take into consideration stock assessment information collected, the recorded commercial catch the previous season, estimates of recreational catch and estimates illegal or black market catches. Prior to setting the TACC each season the TAC Committee also considers advice provided by the relevant industry bodies, the NSW DPI fisheries management, fisheries research and fisheries compliance, and other stakeholders such as environmental groups and the general community. Over recent years the TACC has been set at levels believed to assist in increasing the biomass of the eastern rock lobster stock.

- 2.1(b) Conduct an annual assessment of the eastern rock lobster resource including a review of the exploitation status of the stock and a risk assessment of alternative harvest strategies

Background: Quantitative models of the dynamics of the population of eastern rock lobsters and the impacts of commercial and recreational fishing provide the basis for assessing exploitation status. Based on these models, a risk assessment that forecasts the effects of alternative TACCs on the lobster population provides a basis for the selection of a TACC by the TAC Committee. The assessment of resource status (currently done annually) also provides a comprehensive review of all aspects of each of the monitoring programs currently undertaken.

- 2.1(c) Develop models of the eastern rock lobster population and fishery

Background: Quantitative models of the dynamics of the population of eastern rock lobsters and the impacts of commercial and recreational fishing provide the basis for assessing exploitation status. "Biomass dynamic" and "length-structured" models have been developed and are currently used to assess exploitation status in annual resource assessments. The latter model is calibrated using data that describes catch, catch-per-unit-effort, size-structure of the catch, information about the biology of the eastern rock lobster (eg. rates of growth, size at maturity) and information about the commercial fishery (eg. size-selectivity of traps). The process of modifying and improving the length-structured model is ongoing.

2.1(d) Monitor catch and effort for eastern rock lobster in the commercial Lobster Fishery

Background: Information on the landed catch is collected by both daily logs and monthly catch returns submitted by endorsed fishers in the Lobster Fishery. The daily log sheets are used to collect information on the number, estimated weights and location of eastern rock lobsters taken daily. The monthly catch returns provide a validated weight of catch taken each month. The information gained through monitoring catch and effort in the Lobster Fishery is essential for the stock assessment process and for managing the fishery on a sustainable basis.

2.1(e) Monitor the length and sex composition of commercial landings of eastern rock lobsters

Background: Whilst the quantity of lobsters removed from the population each year is monitored through the logbook program (ie. management response 2.1(d)), to measure the quantity harvested from each size-class in the population requires that the size-distribution of the catch is also monitored. An observer survey stratified over spatial components (based on latitude and depth) of the fishery facilitates monitoring of changes in the size-structure of the catch from these components of the fishery over time. Such information is a basic requirement for the length-structured model of the stock. Annual observer surveys provided such information for the fishery between 1999-00 and 2001-02 and will be repeated periodically in the future.

2.1(f) Monitor recruitment to the population of eastern rock lobsters

Background: A fishery-independent survey of the settlement of pueruli along the coast of NSW has been done each year since 1995-96. This survey provides a measure of changes in recruitment to the population of eastern rock lobsters over time. Moreover, if a relationship between the abundance of pueruli and subsequent recruitment to the fishery is established, this survey provides a means of forecasting (2-3 years in advance) abundance of lobsters entering the fishery. This would reduce significantly the uncertainty associated with recruitment in the forecasting/risk assessment component of the length-structured model. The risk assessment of alternative harvest strategies (e.g. different TACCs) using the length-structured model provides the basis for the determination of the TACC for the fishery each year.

2.1(g) Monitor abundance and size-composition of the spawning stock of eastern rock lobsters

Background: It cannot be assumed that monitoring changes in the catch and catch rates of lobsters in the spawning stock using fishery-dependent data (catch and effort information and observer survey data) provides a robust measure of changes in the abundance of spawning lobsters over time. If practices in the commercial fishery (e.g. size-selective targeting in space or time, size-selectivity of traps) change over time then indices of the abundance of mature lobsters based on such fishery-dependent data will be biased. A fishery-independent survey provides a robust means to monitor changes in the abundance of mature lobsters over time. A fishery-independent survey of the abundance of the mature stock has operated since 1998-99.

Objective 2.2 Provide protection to components of the lobster stock to enhance biological sustainability

- 2.2(a) Provide enhanced protection to the eastern rock lobster spawning stock and in particular reduce the maximum size limit from 200 mm to 180 mm carapace length

Background: The environmental assessment assigned an intermediate risk level to the eastern rock lobster stock and highlighted a possibility of recruitment overfishing, due mainly to the current high level of pressure on the spawning stock. In setting the TACC for 2004-05, the TAC Committee noted that urgent action is required to both protect and rebuild the spawning stock. After significant industry consultation, the decision was made to reduce the maximum size limit from 200 mm to 180 mm. Measures to enhance the protection of the spawning stock over time include further changes to the maximum or minimum legal size limits for eastern rock lobster, changes in fishing areas or seasons and/or setting a lower TACC.

- 2.2(b) Prohibit taking eastern rock lobster below the minimum size limit or above the maximum size limit

Background: The current minimum size limit of eastern rock lobster, set out in the FM (General) Regulation, is 104 mm carapace length. Setting the minimum length for eastern rock lobster prevents targeting of smaller juvenile stocks. The maximum legal length for a retainable eastern rock lobster will change from 200 mm to 180 mm carapace length in accordance with management response 2.2(a). The maximum size limit facilitates the protection of large mature lobsters that contribute more strongly to egg production and are of lesser value (\$ per kg) in the market. Setting the right minimum and maximum size limits for eastern rock lobster will assist in preventing overfishing and providing sufficient levels of exploitable stocks in the longer term.

- 2.2(c) Prohibit taking all female lobsters carrying ova

Background: The majority of eastern rock lobster spawning occurs in waters north of Port Stephens in September to January (spring through to summer) in depths around 50 m, during which time females carry eggs under their abdomen. The eggs are released in early to mid summer.

A prohibition on the taking of females carrying ova (externally underneath their pleopods) provides immediate protection to the fertilised eggs (of the order of 1 million per animal) being carried, thereby maximising egg production.

Objective 2.3 Effectively manage byproduct taken by the fishery

- *2.3(a) Limit lobster fishers to a defined list of species that can be retained as byproduct in the Lobster Fishery when working in waters deeper than 10 m

Background: This response applies to all lobster trapping operations unless the endorsed lobster fisher also holds a demersal fish trap endorsement in the Ocean Trap and Line Fishery. Lobster fishers holding a demersal fish trap endorsement may also retain species permitted to be taken in the Ocean Trap and Line Fishery from waters deeper than 10 m. Although

byproduct species taken in the Lobster Fishery (other than other rock lobster species) have not been recorded on lobster catch returns in the past, it is considered that there are few species taken as byproduct in the Lobster Fishery (Liggins et al., In prep.). Restricting fishers endorsed in the fishery to a defined list of byproduct species aims to prevent any future shift in fishing effort to target species other than eastern rock lobster. The list, contained in this FMS, will be reviewed within two years to ensure the species on the list are still appropriate.

- *2.3(b) Develop a system, in consultation with the Lobster MAC, to provide for appropriate modifications to the list of byproduct species for the Lobster Fishery

Background: With the commencement of this FMS the Lobster Fishery will have a defined list of byproduct species that may be taken by Lobster fishers operating in waters deeper than 10 m. A system needs to be developed to provide an appropriate mechanism for species to be added to, or removed from, the byproduct list taking into account the impacts of that change on the environment and other resource users.

- 2.3(c) Monitor, record and differentiate catches of species of rock lobster on log sheets in addition to eastern rock lobster

*Background: This information has been recorded by lobster fishers on daily log sheets since 1998/99. Records show that less than 1% of rock lobsters taken in the Lobster Fishery are species other than the target species *Jasus verreauxi*. It is important to monitor catches of other rock lobster species as they are targeted by commercial fisheries in other states and do not form part of the TACC in NSW. This information can contribute to any future stock assessments and may assist in monitoring abundance of other rock lobster species in NSW waters.*

- *2.3(d) Modify the catch recording system to record and monitor landings of all other species taken in the fishery (including sharks)

Background: There has been no clear procedure for lobster fishers to record species landed in the fishery other than rock lobsters. Some fishers, who are also endorsed in the Ocean Trap and Line Fishery, enter their other catch from lobster traps on their ocean trap and line catch returns. However, the catch taken out of lobster traps is not part of the Ocean Trap and Line Fishery and needs to be recorded separately. This management response will implement catch recording of all species taken by lobster traps. The information will be used, as necessary, to contribute to resource assessments of byproduct species and the monitoring of any shifts in fishing effort to byproduct species within the Lobster Fishery.

- *2.3(e) Utilise onboard observers to collect additional biological information, to facilitate estimation of size at maturity and fecundity/brood size data, for the elasmobranch species (ie. wobbegong sharks, blind sharks, cat sharks and swell sharks) taken by the fishery

A public consultation draft of an Australian National Plan of Action for the Conservation and Management of Sharks was released in July 2002. This document sets out the need for concerted national action to reduce the risks of commercial and recreational fishing to the variety of shark species found in Australian waters. Two of the primary recommendations in the plan involve improving the identification of captured sharks, thereby increasing the accuracy of reported catch data, and undertaking targeted research on shark species.

In addition to the size and sex composition data collected for elasmobranch species, it is necessary that data be obtained on the important biological characteristics governing maturation and fecundity for those elasmobranch species which are taken by lobster trapping. The generally slow growth rates and low reproductive rates of elasmobranchs make them particularly susceptible to overfishing. The paucity of relevant biological data for the main species taken in the Lobster Fishery needs to be addressed in order to determine if any of these species require more targeted management actions to prevent overfishing of the stocks. This work is best done by onboard observers as shark species are generally cleaned aboard the catching vessel prior to landing.

**2.3(f) Implement changes to reduce the risk of the Lobster Fishery to wobbegong sharks, including:*

- i) a trip limit (applying to a minimum 24 hour period) of 12 wobbegong shark carcasses*
- ii) a minimum legal length for wobbegong sharks of 130 cm total length, subject to scientific peer review of the relevant research and the potential efficacy of a size limit by NSW DPI*
- iii) distributing identification tools to fishers to help differentiate between the separate wobbegong species*

Background: Wobbegong sharks are taken in the Lobster Fishery as a byproduct species in lobster traps. Given that the majority of wobbegong sharks are landed in the Ocean Trap and Line Fishery, the wobbegong shark risk mitigation measures described here for the Lobster Fishery are responsive and consistent with those developed for the Ocean Trap and Line Fishery. Little is known about the biology of wobbegong sharks, and the commercial landing of wobbegong sharks declined steadily from about 120 tonnes in 1990/91 to about 55 tonnes in 1999/2000. In January 2002, NSW Fisheries (now NSW DPI) released a discussion paper 'Management of Wobbegong Sharks in NSW' which sought community and stakeholder submissions on possible management options for wobbegong sharks. There was strong support from the consultation process for maximum and minimum size limits. Discussions with commercial fishers suggest that a maximum size limit is not practical due to the difficulties in measuring large animals.

The trip limit for wobbegong sharks is aimed at preventing targeting while allowing a small limit to provide for legitimate incidental catches in traps when lobster fishers are fishing for lobster. Prior to mandating a 130 cm minimum size limit for wobbegong sharks, NSW DPI will undertake a scientific review of the available research data. In the interim, fishers are encouraged to release wobbegong sharks less than 130 cm in length caught in lobster traps (see management response 1.1(c)).

The effectiveness of these measures will be kept under review. If it is evident that targeting and/or high grading is occurring, or that the risk to sustainable recruitment (particularly in respect of life time fecundity) is not sufficiently mitigated by these measures, then additional measures will be adopted, including the possibility of removal from the permitted byproduct species list.

An identification card will also be developed and distributed to fishers, highlighting the distinguishing features of wobbegong species. An assessment is needed as to whether the different species of wobbegongs can be properly identified without the head (or parts of the head). If not, the whole head or part thereof may need to be retained in future to facilitate proper species identification. The catch reporting system will also be amended to include all species of wobbegong sharks, amongst others (see management response 2.3(d)).

Objective 2.4 Promote the recovery of overfished species

- *2.4(a) Where the Lobster Fishery is a harvester of an overfished species, contribute to the development of any recovery program for the species, and adopt any measures required by a recovery program

There are two recognised types of overfishing; recruitment overfishing and growth overfishing. Recruitment overfishing occurs when insufficient spawning stock remains to ensure adequate recruitment of young fish into the fishery. Recruitment overfishing requires urgent attention, usually in the form of fishery closures to allow the mature population to rebuild. Growth overfishing occurs when fish are harvested at a size much smaller than the optimum size for maximising biological and economic yield. Addressing this problem generally requires an adjustment of the selectivity of fishing gear used to take that species, and the setting or adjustment of a minimum legal size for the species.

For example, the Ocean Trawl Fishery is developing a recovery program for silver trevally, as it is the major harvester of this growth overfished species. As lobster fishers take silver trevally as a byproduct species, the Lobster Fishery will need to comply with the provisions contained within that recovery program.

GOAL 3. Promote the conservation of threatened species, populations and ecological communities and protected species likely to be impacted by the operation of the Lobster Fishery

Objective 3.1 Identify, and minimise or eliminate, any impact of lobster fishing activities on threatened species, populations and ecological communities (including mammals, birds, reptiles, fish, invertebrates and vegetation) and protected species, and where possible promote their recovery

- *3.1(a) Modify the mandatory reporting arrangements, in consultation with the Lobster MAC, to enable the collection of information on interactions with or sightings of threatened or protected marine species and interactions with other threatened or protected species

Background: The 'Guidelines for the ecologically sustainable management of fisheries' approved by the Commonwealth under the Environment Protection and Biodiversity Conservation 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. Information on interactions with threatened and protected species in the Lobster Fishery will come from this modified reporting and the scientific observer survey and any other verifiable interactions with threatened or protected species.

It is important that fishers are able to distinguish threatened and protected species from similar species in order to correctly identify and where possible avoid interactions with them. An example of this type of information is the grey nurse shark identification material. For this purpose, information will be disseminated to endorsement holders to assist them in identifying and avoiding protected and threatened species.

- 3.1(b) Implement, in consultation with the Lobster MAC, the provisions of any relevant threatened species recovery plan, threat abatement plan, priorities action statements or other similar management arrangements designed to protect threatened species and/or critical habitat areas

Background: Once a species, population or ecological community has been listed as threatened, a recovery plan may be developed. A priorities action statement must also be prepared for species listed as threatened under NSW legislation. These are designed to return the species, population or ecological community to a point where its survival in nature is assured. The plans and statements referred to in this response could include those being developed under the Fisheries Management Act 1994, the Threatened Species Conservation Act 1995 or other State or Commonwealth legislation.

Additionally, threatened species legislation requires the development of a threat abatement plan for any listed key threatening processes. A threat abatement plan outlines actions to eliminate or manage the key threatening process, and identifies the authorities responsible for carrying out those actions.

This response recognises that the statutory provisions of a threatened species recovery plan or threat abatement plan, or an arrangement necessary to protect a critical habitat area, must be implemented and given precedence over the provisions of this FMS. In this regard, the fishery and FMS will be responsive and subservient to any additional protection measures as may be required by any recovery or threat abatement plans.

- *3.1(c) Using the code of practice, promote the use of fishing techniques that avoid the capture of, or interaction with, threatened species, protected species and fish protected from commercial fishing

Background: There are a range of measures that could be included in the code of practice that may minimise the interactions or impacts on threatened species, protected species and fish protected from commercial fishing such as using different bait to avoid capture of certain species, and promoting best practice handling techniques. It is already unlawful for any person to retain a threatened or protected species and as such, the focus of this response is to encourage fishers to avoid interactions with these species.

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

Objective 4.1 Provide an appropriate allocation of the rock lobster resource between harvesting sectors, acknowledging the need of seafood consumers to access fresh quality product

- *4.1(a) Refine estimates of total catches of eastern rock lobster, taking into account commercial catch and estimates of recreational, Indigenous and illegal catches, for use in stock assessment models and reports to the TAC Committee

Background: When setting the TACC for the commercial Lobster Fishery, the TAC Committee currently takes into account estimates of total catches including illegal and recreational (including indigenous) catches. The accuracy of estimates of non-commercial catch will impact directly on the robustness of stock assessment information. Illegal catch includes any unreported commercial catch, lobsters taken in excess of the bag limit or sold by unlicensed fishers and catches of prohibited size or berried lobsters. Information on illegal catches will come from surveys of commercial fishers and fish receivers, and from the results of compliance actions. In order to gain better information on non-commercial catches, as well as recording quantities of sighted illegal catches (undersize, excess bag, speared, etc.), NSW DPI is implementing a system of recording all lobsters sighted in the possession of recreational fishers. NSW DPI Compliance Officers will collect this data as part of the compliance Program Activity Reporting (PAR) system. Information on the recreational and Indigenous catch will be drawn from the results of the National Recreational and Indigenous Fishing Survey, related studies to be undertaken in NSW and information obtained from other sources such as charter boat logbooks. The TAC Committee and the environmental impact assessment for this fishery have highlighted the importance of obtaining accurate estimates of recreational rock lobster catch.

Further work will be needed to define specific targets for appropriate sharing of the resource and what might be considered negative social impacts. A performance indicator has been developed (see section 10 of this FMS) which will trigger a review if the relative catch (or estimated catch) between the commercial and non-commercial sectors shifts significantly. It should also be noted that the range of restrictions on the Lobster Fishery, in particular the TACC setting process, limits the commercial catch and makes eastern rock lobsters available to other sectors.

Objective 4.2 Provide for fair and equitable sharing of the eastern rock lobster resource within the Lobster Fishery

- 4.2(a) Limit the maximum shareholding in the fishery to 350 shares

Background: The implementation of share trading schemes can lead to reducing the control of access rights to a small number of businesses, if not limited. Following concern expressed by industry over the issue, a maximum shareholding limit was set and implemented through the FM (Lobster SMP) Regulation.

***4.2(b) Provide for the transmission of a shareholding to more than one person**

Background: Share transmission occurs when a shareholding is passed on in accordance with a will. The FM (Lobster SMP) Regulation only allows such transactions if all shares in a shareholding are transmitted to one person. This amendment to the legislation will enhance social equity by allowing a shareholding to be allocated to more than one beneficiary.

Objective 4.3 Provide for fair and equitable management of the interactions between the Lobster Fishery and other commercial fisheries (NSW, interstate and Commonwealth)

4.3(a) Use cross-fishery consultation to discuss and manage issues relating to, but not limited to, the multiple use of specific fishing grounds, collaborative research, fair and equitable access to stocks, complementary management arrangements and other interactions between fishing sectors

Background: Although rock lobsters cannot be taken by other commercial fisheries in NSW, cross fishery consultation allows issues relating to commonly shared fish stocks to be addressed (e.g. some finfish species may be taken in both the Lobster Fishery as byproduct and the Ocean Trap and Line Fishery as target species). Cross fishery consultation also assists in the resolution of issues that arise from the physical interaction of operations between multiple NSW commercial fisheries. For example, the interaction of NSW ocean trawling operations and the Commonwealth East Coast Tuna and Billfish Fishery with lobster trapping operations and potential damage or loss of gear that may result from these fisheries working in the same fishing grounds.

***4.3(b) Require the use of fish escape panels in lobster traps if it becomes evident that lobster traps are being used to target finfish**

Background: The FMS for the Ocean Trap and Line Fishery requires the use of escape panels in fish traps. Given the similarities in dimensions between lobster traps and fish traps, there is potential for dual endorsed fishers to circumvent the requirement to use escape panels in fish traps, by using lobster traps to target finfish. Observer surveys indicate that the normal use of lobster traps results in a relatively low amount of byproduct and bycatch, due to the area of their operation. Accordingly, fish escape panels will not be mandatory in lobster traps used by dual licensed operators unless it becomes apparent, through the performance indicator monitoring finfish landings in the Lobster Fishery (see section 10 of this FMS) or otherwise, that the ocean trap and line management arrangements are being circumvented. If required, the escape panels introduced into lobster traps will have the specifications of those required in the Ocean Trap and Line Fishery. The requirement may be applied on a fishery-wide, regional or individual fisher level.

4.3(c) The NSW Department of Primary Industries will work cooperatively with staff from other jurisdictions (e.g. Commonwealth, Victoria, Tasmania, Queensland) regarding management, research and compliance arrangements for rock lobster species

Background: Eastern rock lobster and southern rock lobster are found in Victorian and Tasmanian waters as well as NSW waters. Painted rock lobster is found in NSW waters and across northern Australia, including Queensland waters. Where possible, it is important to have consistent or complementary management arrangements for shared stocks between jurisdictions. For example initiatives such as stock assessment, complementary size limits, and

monitoring programs for shared species. Monitoring the commercial catch of eastern rock lobster, southern rock lobster and painted rock lobster as well as the management arrangements relating to these species in other states will assist in consistent management of the stock.

Objective 4.4 Identify and mitigate negative impacts of the Lobster Fishery on Aboriginal or other cultural heritage

4.4(a) Manage the Lobster Fishery in a manner consistent with the Indigenous Fisheries Strategy and Implementation Plan

Background: The Indigenous Fisheries Strategy (IFS) was released during December 2002. The IFS puts in place a process that will ensure discussion and negotiation to resolve problems and challenges in relation to indigenous involvement in the fisheries of NSW including the issues raised in the Indigenous heritage assessment component of this EIS.

This FMS is responsive to the processes developed under the IFS, including the arrangements for Aboriginal representation on the LobMAC and recommendations in respect of regional cultural catches. Additionally, the LobMAC is encouraged to be involved in the development and roll-out of the IFS Implementation Plan with respect to lobster fishing.

4.4(b) Modify the activity, where relevant, in response to new information about areas or objects of cultural significance in order to minimise the risk from lobster fishing activities

Background: Fishers in the Lobster Fishery must respond appropriately to new information about items or locations of Aboriginal and other cultural significance (e.g. a recently uncovered shipwreck) and this management response seeks to reinforce that intention.

Objective 4.5 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 resource

4.5(a) In consultation with the Lobster MAC, identify areas of high interaction between the Lobster Fishery and other resource users and respond appropriately to resolve any conflicts

Background: It is important, when promoting harmony amongst all resource users, to negotiate with industry and the community to determine the most appropriate use of commercial fishing gear in areas where more than one resource user group is apparent. Issues over access to fishery resources or locations typically arise in areas where there is high interaction between multiple user groups. Commercial fishing operations may interact with other water-based activities such as recreational boating, diving, fishing, surfing or even swimming. For example the FM (Lobster SMP) Regulation was amended following negotiation between recreational users and the commercial industry, to allow the use of alternative trap marking methods in coastal waters with high recreational use. Public safety is paramount and the share management plan allows for the registration of waters within which there is a requirement to mark lobster traps with either a plastic tag or concrete block (at the base of the trap) to avoid potential for other water users to become entangled in the head gear. The maps developed under management response 1.1(e) will be important for the effective implementation of this management response.

GOAL 5. Promote a viable commercial fishery, consistent with ecological sustainability

Objective 5.1 Promote the long term economic viability of lobster fishing and assess the economic benefits of the fishery to the community

- *5.1(a) Investigate the application of minimum shareholding requirements for all shareholders to be eligible for an endorsement, in order to promote positive returns at the fishery level, and implement the outcome of the investigation

Background: New entrants to the Lobster Fishery (ie. those who have entered the fishery since the commencement of the share management plan in 2000) must hold a minimum of 55 shares before an endorsement will be issued with respect to that shareholding. When the Lobster Fishery became a share management fishery, it was anticipated that small shareholders may take the opportunity to retire from the Lobster Fishery and allow those fishers who rely more heavily on lobster fishing to expand their businesses. However, share trading has not encouraged sufficient restructuring in the fishery, with a considerable number of smaller shareholders holding on to, and fishing, their shares.

In addition, as the Lobster Fishery is managed through a system of individual transferable quotas, it is expected that quota would move to those fishers who can harvest the resource at the lowest cost, and for the greatest return, resulting in a positive net return for the fishery as a whole. Current data suggest that average net returns across the lobster fishery are negative.

As fishing businesses holding a small number of lobster shares may be less economically viable in the long term, setting an appropriate minimum shareholding applicable to all shareholders may provide a means of improving average net returns at the fishery level.

- *5.1(b) Limit shareholders from acquiring, through quota transfer, more than 100 per cent of the amount of his or her initial quota allocation for the fishing period

Background: Under the existing Lobster Share Management Plan, shareholders may not acquire through quota transfer more than twice the amount of his or her initial quota for the fishing period. The Lobster MAC has recommended that the maximum amount of quota which a shareholder may acquire through quota transfer be restricted to equal the amount of the shareholder's initial quota allocation during a fishing period. The intention is to further encourage lobster shareholders to purchase shares, thus promoting restructure of the fishery, rather than allowing small shareholders to buy large quantities of quota without the longer term commitment to the fishery.

- 5.1(c) Allow for the storage of live eastern rock lobsters

Background: Clause 42 of the Lobster SMP Regulation provides for the storage of live rock lobsters in holding pens, provided the conditions outlined in the regulation are adhered to. The use of storage facilities allows for lobster fishers to regulate the distribution of their rock lobsters to markets and maximise their economic return. See section 3.1.3 of this FMS for information on storage of live lobsters.

- 5.1(d) Identify and promote harvest and post-harvest practices that ensure the best return in dollars per kilogram for product taken in the fishery, within the context of the fishing regulatory controls that apply to harvesting

Background: The economic viability of the fishery is in part dependent on obtaining the best return possible for the product landed. Opportunities are likely to arise where the economic return to the fishery could be increased by improving handling practices or value adding (e.g. allowing for the storage of live eastern rock lobsters), and it is in the interests of the fishery to widely promote such practices. Good post-harvest practices can be promoted through the code of practice that is to be prepared for the fishery.

- *5.1(e) Refine the performance indicator for monitoring trends in the commercial viability of typical fishing businesses within each designated commercial fishing activity, so as to be based on net returns

Background: This FMS includes a new performance indicator for monitoring economic viability of fishing businesses holding lobster shares. Net return rather than gross return is a better indicator of economic performance as it accounts for changes in fishers' costs over time. An understanding of the average net return across fishing businesses requires data on seafood prices, as well as the cost of inputs such as fishing gear, fuel and bait.

Information on the average annual price per kilogram of eastern rock lobster is obtained through Sydney Fish Market records. Prices have been monitored since the 1948-49 fishing period and are indexed to the Consumer Price Index (CPI) using the CPI value for the September quarter each year.

Data on the costs of going fishing are not routinely collected. A process will be developed in consultation with the MAC to determine how best to collect this data, taking into account confidentiality/privacy concerns and the cost-effectiveness of the data collection methods. Once this process is developed, the performance indicator can be refined as needed.

Data on net returns is also useful for setting the TACC. A TACC that maximises net returns to lobster fishers ensures that the lobster resource is being harvested at the point where the greatest net return to society is achieved.

- *5.1(f) Investigate the data available to assess the economic multiplier (flow-on) effects of commercial fishing, including the Lobster Fishery, to the broader community, and develop strategies to improve the quality/usefulness of such data

Background: There have been few detailed assessments of the economic benefits of commercial fishing, in terms of flow-on effects for local and regional economies. Fishing activities (and in this case expenditure and income associated with the activity of commercial lobster fishing) are believed to be important to many local economies. There is little doubt that some coastal communities derive substantial economic benefits from lobster fishing, not only from direct employment but also from the provision of ancillary services. There may be some areas where the economic impacts of management changes need to be directly assessed, taking account of the actions in this FMS. Advice will be sought from the Lobster MAC and experts in economic analysis on the best data to use to describe the multiplier effects of the commercial fisheries, and to assess any significant impacts.

- 5.1(g) Collect information to detect patterns in the quantity and price of share transfers and the quantity of quota traded, and investigate the feasibility of collecting data on the price of quota traded

Background: Monitoring the quantity and price of share transfers has been undertaken since lobster shares were first traded and enables analyses of temporal and regional fluctuations. However, while information on the quantity of quota traded is collected, the price at which quota is traded is not routinely reported. A means by which this data could be collected, taking into account privacy and confidentiality issues, will be investigated. Quota transfer prices, which incorporate short term fluctuations in the fishery, provide a short term measure of economic viability, while share transfer prices, which incorporate future expectations, provide a longer term measure of economic health in the fishery.

The information collected through this management response assists in measuring the economic viability of the fishery and is taken into account by the TAC Committee in setting the annual TACC for eastern rock lobster.

Objective 5.2 Maximise the efficiency of trading quota

- *5.2(a) Investigate the feasibility of implementing an exchange accessible by all lobster shareholders transferring quota and implement the outcomes of the investigation

Background: Since the introduction of the quota management system, some lobster fishers have had difficulty in locating and contacting other fishers wanting to either sell or buy lobster quota. This is likely to have increased the transactions costs of trading quota. An exchange allowing lobster fishers access to the details of willing fishers such as name, contact numbers and size of quota to be transferred, would greatly assist in maximising the efficiency of the quota transfer system and increase the ability of fishers to harvest the TACC.

Objective 5.3 Appropriately manage food safety risks in the harvesting of fish in the fishery

- 5.3(a) Co-operate with the NSW Food Authority in the development and implementation of food safety programs relevant to the fishery

Background: The NSW Food Authority is currently in the process of developing food safety plans for the 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 product harvested by the fishery and protecting viability of the industry.

GOAL 6. Facilitate effective and efficient compliance, research and management of the Lobster Fishery

Objective 6.1 Ensure a transparent and focused approach to compliance, research and management of the Lobster Fishery

- 6.1(a) Utilise and review, in consultation with the Lobster MAC and key stakeholders, the compliance strategic plan and update where appropriate

Background: The compliance strategic plan for the Lobster Fishery is included in the Lobster Share Management Plan and includes the broad, long term priorities and strategies for compliance in the fishery. The NSW DPI (previously NSW Fisheries) first developed and implemented a Statewide Operational Plan for the Lobster Fishery in 1999 to guide the compliance programs of the fisheries investigation unit. This plan is updated annually by the Fisheries Investigations Unit, monitoring trends and compliance issues as they arise. Fisheries officers in each office operate under a district compliance plan to ensure appropriate compliance coverage across all programs.

The Statewide Operational Plan for the Lobster Fishery and each District compliance plan are developed to be consistent with the Statewide Compliance Plan for NSW. The Statewide Compliance Plan is an overarching framework for all fisheries that identifies priorities and objectives for compliance throughout the State.

- 6.1(b) Utilise and review, in consultation with the Lobster MAC and key stakeholders, the research strategic plan and update where appropriate

Background: The strategic plan for research for the Lobster Fishery specifies research and monitoring projects that are currently being done, planned for the future or proposed as possible future initiatives. The relative priority of the different projects, sources of funding and a brief description of objectives are also described. Revisions to the strategic plan generally occur annually as a result of changing priorities and budgets. Reviews of the plan are undertaken with full consultation of the Lobster MAC.

Objective 6.2 Maximise compliance in the Lobster Fishery

- *6.2(a) Utilise, review and amend (where appropriate) the share forfeiture scheme based on demerit points, following the implementation of an endorsement suspension/share forfeiture scheme in other NSW share management fisheries

Background: The share forfeiture offences and the share forfeiture scheme for the Lobster Fishery are defined in the FM (Lobster SMP) Regulation. Section 75 of the FM Act provides for shares to be forfeited if a shareholder is convicted of an offence against this Act.

A penalty points scheme linked to endorsement suspension and share forfeiture provisions will be introduced in all other NSW share management fisheries. The current share forfeiture scheme in the Lobster Fishery will be reviewed, in consultation with the Lobster MAC, to ensure a consistent and/or complementary approach across all schemes. The introduction of

share forfeiture/endorsement suspension scheme across all share management fisheries would create an effective deterrent for serious or habitual offenders.

6.2(b) Require all eastern rock lobsters taken in the Lobster Fishery to have an approved tag attached

Background: Tags are required to be fitted to commercially caught lobsters to distinguish between those lobsters taken legitimately by licensed commercial lobster fishers and those taken for non-commercial purposes or taken illegally. The requirement of tags in order to sell eastern rock lobsters provides a deterrent to black marketing. Under clause 116A of the FM (General) Regulation, eastern rock lobsters taken in NSW waters must not be sold unless a tag is attached to it in such a manner that the tag cannot be removed without being broken. Part 6 of the FM (Lobster SMP) Regulation further defines the requirements associated with the use of tags in the Lobster Fishery.

*6.2(c) Investigate the feasibility, and implement the outcome, of introducing:

- (i) a requirement that lobster fishers include tag numbers of marketed lobsters on prescribed records to enable effective auditing; and
- (ii) arrangements for validating daily lobster landings and other catch and effort data to improve the robustness of the data, where necessary

Background: The NSW DPI conducts audits of lobster fishers by comparing catch return information with prescribed records. The inclusion of tag numbers on prescribed records would increase the ability of these audits to detect illegal activities. To improve the integrity of the quota management system, the validation of landings (and other catch data) the use of systems such as bar coding and scanning to enable large quantities of lobster tags to be recorded and reconciled against prescribed records will be assessed. The feasibility study will include assessment of the economic implications to individual fishing businesses of implementing these auditing and validation systems.

*6.2(d) Introduce a requirement that the marking required on each lobster trap to indicate the position of the trap must include (in clearly legible figures which are no less than 50 mm in height):

- (i) the fishing business (FB) number of the fishing business with which the traps are associated, and
- (ii) the letter "L" (for lobster trap)

Background: It is important for compliance purposes that gear set by lobster fishers can be easily identified by Fisheries Officers as lobster traps and that the gear can be traced back to the relevant fishing business. The clear marking of fishing gear can assist in reducing conflict between fishers that may arise over the ownership of set gear and/or the fish caught by that gear.

Most traps used in the Lobster Fishery are marked using a buoy and figures of a colour that contrasts to that of the buoy. In waters included on a register maintained by the NSW DPI (associated with high recreational use) a plastic tag or concrete block must be used to mark a trap instead of a buoy. This response will apply to the marking of all traps used in the fishery. A phase in period, determined in consultation with the Lobster MAC, will be necessary to allow for a gradual transition to the new trap marking requirements.

- *6.2(e) Develop strategies to support appropriate practices and behaviour in commercial fisheries, including development of training and accreditation courses in core competencies and the introduction of fit and proper person requirements

Background: The minimum qualifications will aim to ensure that fishers have a sound understanding of the fishery and the rules that apply, including the need for provision of accurate data. Increasing the professionalism of operators can provide long term benefits to the industry.

The Lobster Fishery already applies some fit and proper person requirements to endorsement holders and crew members, though they are limited because they apply only to new entrants to the fishery. This response will allow an examination of the appropriateness of the existing fit and proper person provisions and ensure that the provisions within the Lobster Fishery are complementary to those to be developed for other NSW commercial fisheries.

Objective 6.3 Provide effective and efficient communication and consultation mechanisms for the Lobster Fishery

- 6.3(a) Utilise key consultative bodies, such as the Lobster Management Advisory Committee (MAC) when undertaking industry consultation on all aspects of the Lobster Fishery

Background: The Lobster MAC provides advice to the Minister for Primary Industries on a broad range of issues relating to the management of the Lobster Fishery. The MAC includes endorsed commercial fishers elected to represent the interests of those in the Lobster Fishery and non-industry members, appointed by the Minister for Primary Industries, to represent other interest groups such as indigenous, recreational and conservation groups. The MAC provides a forum for discussion on issues relating to the fishery. See section 7.1 of this FMS for further information. Other consultative bodies such as the Seafood Industry Advisory Council may also be utilised.

Objective 6.4 Implement this Strategy in a manner consistent with related Commonwealth and State endorsed programs aimed at protecting aquatic environments, and achieving the objectives of ecologically sustainable development

- 6.4(a) Manage the Lobster Fishery consistently with other jurisdictional or natural resource management requirements, such as the marine parks program, aquatic biodiversity strategy, threatened species program, Indigenous Fisheries Strategy and other relevant strategies

Background: The FMS will be operating alongside other programs relating to the management of marine resources, and must be consistent with those programs. The FMS must be adaptive if inconsistencies between the programs become apparent. This response enables a whole-of-government approach to management of the marine ecosystem.

- 6.4(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 varies to that specified in the FM Act and its regulations. Approval to trial new approaches to fishing gear design is commonly given to industry members participating in research.

GOAL 7. Improve knowledge of the Lobster Fishery and the resources upon which the fishery relies

Objective 7.1 Improve the community's understanding of commercial lobster fishing

7.1(a) Contribute to the ongoing education of shareholders through advisory programs and port meetings

Background: The NSW DPI conducts regional (ie. port) meetings annually to update fishers on developments within different areas of the fishery and general management, research and compliance issues. The forums provide an opportunity for fishers to ask questions, make suggestions and clarify current regulations and policies. These forums have proved to be popular and an effective mechanism for reaching fishers with information on aspects of their fishery is an effective education tool.

7.1(b) Promote awareness of the Lobster Fishery as part of the overall communication strategy across all commercial designated fishing activities by implementing issue-focussed education programs

Background: Together with the Lobster MAC, the NSW DPI will develop and monitor programs to ensure they are cost-effective. As an initial step, the Lobster FMS and EIS and any resulting reports will be made available to the public by placing them on the NSW DPI website and providing copies at the NSW DPI Fisheries Offices.

Objective 7.2 Promote scientific research and monitoring to gain knowledge of eastern rock lobster, byproduct and bycatch species and the impacts of fishing on other species and the environment, and the status of the fishery as a whole, including economic and social factors

7.2(a) Undertake research programs in accordance with the research strategic plan for the Lobster Fishery

Background: The strategic plan for research in the Lobster Fishery identifies the research and monitoring projects that are currently being undertaken, are planned for the future or are proposed as possible future initiatives. The core project described in the strategy concerns the annual assessment of the status of the rock lobster resource. Crucial to this project, are the other current research projects: (i) the development of models of the stock and fishery; (ii) the logbook program and analysis of catch and effort data from the commercial fishery; (iii) an observer-based survey of the size-structure of commercial catches; (iv) an observer survey of the byproduct and bycatch taken in lobster traps; (v) investigation of the relationship between puerulus abundance and subsequent recruitment to the fishery; (vi) a fishery-independent survey of the abundance of mature lobsters; (vii) investigations of the growth and movement of lobsters. The strategic plan for research will be updated to reflect the priorities set by the Lobster MAC and to take into account the environmental risks identified in the EIS for the fishery.

- *7.2(b) Develop a strategy, in consultation with the Lobster MAC and taking into account the information gaps outlined in the economic and social assessment in the Environmental Impact Statement, to identify the nature and causes of economic issues affecting the industry and develop objectives to address these issues and promote effective structural adjustment in the fishery

Background: The gathering of social and economic information will aid in understanding the implications of changes to fishing rules over time and will assist in refining the performance indicator for monitoring trends in the commercial viability of fishing businesses. An economic and social survey conducted as part of the environmental assessment process has provided some information on economic and social issues in the Lobster Fishery. 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.

Objective 7.3 Maintain and improve the quality of the catch and effort information collected from endorsement holders

- 7.3(a) Require every commercial fisher endorsed in the Lobster Fishery to make a record of all rock lobsters taken each day (ie. daily log books) and each month (ie. monthly reconciliation forms) and send a copy to the NSW Department of Primary Industries within seven days following the end of the day fished and within seven days after the end of the month (respectively)

Background: The FM (Lobster SMP) Regulation requires daily recording of catch by fishers in order to administer the quota system and maintain quality catch and effort information. The catch and effort information contributes to monitoring temporal and spatial trends in effort within the fishery and ultimately the stock assessment of eastern rock lobster. Upon amendment of the monthly reporting forms, information will be collected on trap loss, interactions with threatened species and the composition and quantity of byproduct taken in the fishery; essential information for managing the Lobster Fishery on a sustainable basis.

- 7.3(b) Periodically review, in consultation with the Lobster MAC, the mandatory catch and effort return forms submitted by lobster fishers and implement changes if the data collected is perceived to be insufficient for monitoring and assessment purposes

Background: The information collected on lobster daily log sheets is comprehensive, particularly for the target species. Staff from the NSW DPI periodically review catch and effort returns in consultation with the Lobster MAC to improve the quality of data collected. The risk assessment has identified further information which needs to be gathered by routine reporting such as recording all byproduct taken, interactions with threatened and protected species and trap loss. These reporting changes will be discussed with the Lobster MAC.

- *7.3(c) Assess the accuracy of species identification recorded in catch records and provide advice to industry to make needed changes

Background: Management response 2.3(d) requires fishers to report all species taken (in addition to rock lobster species). Correct species identification is critical to monitoring the performance of the fishery. Whilst many species are clearly and easily identified, there are some species for which correct identification or reporting can be difficult (e.g. the different species of leatherjackets). The observer program may provide first hand information on local

names for fish. This information will be used to ensure that industry advice and education is appropriately targeted.

10. Performance Monitoring and Review

10.1 Performance monitoring

Many of the management responses listed in section 9 of this FMS 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 FMS against the seven goals (i.e. the major objectives). A periodic report will, however, be prepared (as outlined later in this section) detailing the progress made in implementing each of the management responses.

10.1.1 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 10.2. The performance indicators defined in the NSW Lobster Share Management Plan and monitored since its introduction in 2000, have been incorporated where appropriate into this table.

It should be noted that a small number of more direct performance indicators have been selected rather than using a large number of surrogate indicators, in order that the limited resources available for implementation of the FMS can be most effectively utilised. These will be further refined in light of the practical implementation of this FMS.

Data requirements and availability

The data requirements and availability for each performance indicator in Table 10.2 relate to the collection of information to measure performance indicators. The data requirements 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.

Robustness

The robustness ratings applied to each performance indicator in Table 10.2 have been selected using the definitions outlined in Table 10.1 below.

Table 10.1 Robustness classifications (Source: SCFA, 2000)

Robustness level	Description
High	The indicator is a direct measure of the goal or, if indirect, is known to closely reflect changes in the issue of interest
Medium	The indicator is suspected to be a reasonably accurate measure against the goal, or the known error is in the conservative direction
Low	The degree to which the indicator measures against the objective is largely unknown or known to be low. Often this will involve surrogate indicators

10.1.2 Trigger points

The trigger points specify the point when a performance indicator has reached a level that suggests a potential problem with the fishery and a review is required. The review will determine the suspected reasons for the breach of the trigger point and whether any action is required (see section 10.3.2 for further information on reviews in response to trigger points).

Table 10.2 establishes the performance indicators and trigger points that will be used to measure whether each of the management goals described in section 9 of this FMS are being attained. As the performance indicators defined in the FM (Lobster SMP) Regulation have been incorporated into Table 10.2, so have the triggers associated with them.

10.2 Predetermined review of performance indicators and trigger points

It is likely that changes to the activities authorised under the FMS will evolve over time. It is also possible 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 FMS. If new information becomes available as a result of research programs, more appropriate performance indicators and trigger points can be developed and the Minister for Primary Industries may amend the FMS.

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 FMS, in consultation with the Lobster 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.

Table 10.2 Performance indicators and trigger points for the fishery.

GOAL 1. Manage the NSW Lobster Fishery in a manner that promotes the conservation of biological diversity in the marine environment					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	The estimated quantity of bycatch which is discarded	Estimates of discarded catch (other than lobster) and information on any relevant gear changes in the fishery	The estimated quantity of bycatch increases between consecutive observer surveys	Low	It is difficult to directly measure the impact of this fishery on biodiversity in the ocean environment as the ecological relationships between lobsters and other marine organisms are largely unknown. However, provided the lobster resource is not overfished, and given the habitat impacts are relatively minor and the relatively low levels of byproduct and bycatch, the risk of significant adverse impacts on biodiversity is likely to be minor.
2	Species composition (for all retained and bycatch species) taken by the fishery	Quantitative landings from fisher logbooks and discard data from onboard observer surveys	Significant shift in species composition detected between consecutive observer surveys for any method	Medium	Gray (1997) describes a range of species richness indexes which may assist in determining whether significant shifts in species composition have occurred
3	Response of the fishery to marine pest and disease incursions	Reports on the monitoring of marine pests and diseases are needed and will be provided to the Lobster MAC through the Marine Pest Management Program	Guidelines specified in any Marine Pest and Disease Management Program are not adopted by the Lobster Fishery	Medium	Marine Pest and Disease Management Programs are responsible for monitoring marine pests and diseases (e.g. noxious fish), and developing contingency plans in the event of new incursions. This performance measure monitors whether management of the fishery is responsive to existing or new marine pest or disease incursions that may threaten the biodiversity in the marine environment
4	Areas closed to commercial lobster fishing in NSW managed waters	Spatial information is required for all closures (including marine parks, aquatic reserves and section 8 fishing closures). This information is available through the Marine Parks Authority and through NSW DPI in the event of any future fishing closures implemented for fishery management purposes.	Areas closed to commercial lobster fishing become open after the commencement of the FMS	Medium	Significant closed areas prevent any direct impacts of the fishery on biodiversity in those areas, thus reducing the total impact on biodiversity at the regional or state scale. A triggered review would consider the merits of opening and/or closing different areas to the Lobster Fishery.

GOAL 2. Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	Abundance/biomass of spawning stock relative to pre-exploitation level (model based estimates)	Monitoring of commercial landings, estimates of catch from non-commercial sectors, size-structure of annual catch, indices of puerulus abundance, indices of abundance of spawning stock. Data can be extracted from the ongoing research and monitoring program and, in the case of estimates of non-commercial catch, from any recreational surveys and compliance observations.	Biomass of spawning stock is depleted to less than 25% of pre-exploitation level	High	A depletion of spawning stock below 25% is deemed to present an unacceptable risk of recruitment overfishing and stock collapse
2	Trend in abundance/biomass of spawning stock	Annual estimates of an index of abundance of spawning stock based on catch per trap-lift. Data is available from the fishery-independent survey of the abundance of mature lobsters.	The index of abundance of spawning stock decreases in two consecutive years	High	The index of abundance from the fishery independent survey provides the most timely estimate of relative change in spawner abundance each year. Changes in relative abundance will generally be detected in surveys before becoming apparent in model-based estimates of abundance.
3	Annual eastern rock lobster landings compared with TACC set for eastern rock lobsters	Landings data is required and will be obtained through daily and monthly catch reporting provided by endorsed lobster fishers. The annual report from the TAC Committee is also required and available.	Ratio of annual commercial catch to TACC is below 85% in two consecutive years	Medium	The TACC for eastern rock lobster is set each year giving consideration to the current resource assessment, including the performance of the fishery in the previous year. This performance indicator measures the ability of the commercial fishery to take the TACC. One key factor that contributes to this is the abundance of eastern rock lobsters
4	Ratio of total annual landings of all byproduct species to eastern rock lobster taken by the Lobster Fishery	Requires commercial landings data for all species taken in the fishery. Data will be obtained through mandatory catch reporting by endorsed lobster fishers, as outlined in management response 2.3(d).	Ratio of byproduct species to total lobster landings in any one year exceeds a percentage to be determined following the collection of two years of recorded byproduct data	Low	The byproduct component in the Lobster Fishery is small compared with landings of these species in other commercial and/or recreational fisheries, nevertheless it should be monitored. This indicator does not measure sustainability levels per se, but might indicate shifts in targeting or sudden declines or increases in catch of byproduct species. A specific trigger point will be able to be set for this indicator after two years of collection of the data.

GOAL 2 (cont'd). Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
5	Commercial landings of hermit crabs	Quantitative landings data on hermit crab landings from catch reporting system	Commercial landings of hermit crabs exceed 30 tonnes per fishing period	Medium	Previous observer work indicates that hermit crabs are incidentally captured in large quantities (approximately 140 tonnes per year) by lobster traps, most of which (approx. 83 %) are discarded. Discard mortality of hermit crabs is assumed to be negligible. As little is known about hermit crab biology, the FMS needs to contain a trigger in the event of the emergence of a viable market for hermit crabs that results in significant quantities being landed.
6	Annual landings of wobbegong sharks by the Lobster Fishery	Quantitative identification and landings data on wobbegong sharks from the catch reporting system	Lobster Fishery landings of wobbegong sharks exceed 8 tonnes	Medium	The 8 tonne trigger point reflects current byproduct catch levels of wobbegong sharks, measured from observer studies. It is expected that landings will decrease following the introduction of the daily trip limit and potentially a minimum legal size for these species. This performance indicator is necessary as a precautionary measure given the high risk level assigned to these species in the environmental assessment and to promote consideration of additional management action if wobbegong shark landings increase in the Lobster Fishery.

GOAL 3. Promote the conservation of threatened species, populations and ecological communities and protected species of fish likely to be impacted by the operation of the Lobster Fishery					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	Interactions between the fishery and threatened species, populations or ecological communities which may threaten the survival of a threatened species, population or ecological community	Data will be obtained through catch reporting provided by endorsed lobster fishers. Consideration will also be given to any data collected through periodic observer surveys.	Any interactions between the fishery and a threatened species, population or ecological community that are likely to threaten the survival of that threatened species, population or ecological community, as determined by the Director-General of NSW DPI on advice from relevant threatened species experts	High	Currently, little information is available on interactions between the Lobster Fishery and threatened species, but limited observer data suggest a very low level of interaction. Commercial fishers are required to report a variety of details when an interaction occurs with a threatened species including contact or capture with gear and condition upon release. Every interaction recorded will be referred to the relevant threatened species authority to determine whether the interaction is likely to threaten the survival of a threatened species, population or ecological community. Any such assessment should include consideration of trends in the number or degree of interactions as well as any other cumulative impacts.
2	Interactions between the fishery and protected species which may threaten the survival of a protected species	Data will be obtained through catch reporting provided by endorsed lobster fishers, and also by any onboard observer surveys and reports from compliance officers	A biennial review undertaken on interactions between the fishery and a protected species (reported by endorsement holders in the fishery or observed during an observer survey) finds that the fishery is likely to threaten the survival of that protected species, as determined by the Director-General of NSW DPI on advice from relevant threatened species experts	High	Currently, little information is available on interactions between the Lobster Fishery and protected species, but limited observer data suggest a low level of interaction. Commercial fishers are required to report a variety of details when an interaction occurs with a protected species including contact or capture with gear and condition upon release. NSW DPI will undertake an annual review of the level of interaction with protected species to determine whether the levels are likely to threaten the survival of a protected species. Any such assessment should include: consultation with the relevant authority; consideration of trends in the number or degree of interactions; as well as any other cumulative impacts.

GOAL 4. Appropriately share the resource and carry out fishing in a manner that minimises negative social impacts					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	Change in the distribution of eastern rock lobster landings between the <i>commercial</i> sector and <i>non-commercial</i> sectors (combining recreational and Indigenous)	Requires commercial landings data and information (or estimates) of catches by other stakeholder sectors. Data will be obtained through mandatory catch reporting provided by endorsed lobster fishers and through any recreational and Indigenous fishing surveys and compliance observations.	Maximum absolute difference in the distribution of catch between the commercial and non-commercial sectors is greater than 25 percentage points when compared every five years	Medium	Further work would be needed to define specific targets for appropriate sharing of the resource and what might be considered a negative social impact. In the interim, an arbitrary trigger point has been specified that will detect a relatively large shift in eastern rock lobster catch over time between the commercial sector and other stakeholder sectors. This performance indicator can only be measured if updated estimates of non-commercial catch become available between comparison years.
2	Quantity of finfish landings in the Lobster Fishery compared to the Ocean Trap and Line Fishery	Requires commercial landings data for all species taken in the fishery. Data will be obtained through mandatory catch reporting by endorsed lobster fishers, as outlined in management response 2.3(d), and through periodic observer surveys.	To be determined following one year of collection of baseline data	Medium	This indicator will assist in monitoring any change in targeting practices by lobster fishers that may result from restrictions placed on other commercial fisheries. For example, this indicator will detect if dual endorsed lobster and trap & line fishers are using lobster traps (which, unlike fish traps, do not require fish escape panels) to target finfish. It will ensure action is undertaken should a shift in the allocation of the resource between commercial fisheries occur.

GOAL 5. Promote a viable commercial fishery, consistent with ecological sustainability					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	Abundance/biomass of the exploitable component (i.e. within the range of minimum and maximum legal lengths) of the stock of eastern rock lobsters (indicated by raw CPUE and model based estimates of abundance)	CPUE (catch per trap-lift) and estimates of exploitable biomass are required. CPUE can be calculated from daily log books and exploitable biomass estimates will be available from the length structured stock assessment model.	1. CPUE is less than the mean of annual CPUEs during the reference period 1994-95 to 2003-04 OR 2. Estimated exploitable biomass is less than mean of annual estimates of exploitable biomass during the reference period 1994-95 to 2003-04	Medium	The abundance/biomass of lobsters within the legal range of sizes affects the TACC that can be set, the catch and ultimately the economic return for the fishery
2	Net economic returns to the fishery	Requires data on the average market price of fish (CPI adjusted), total commercial landings in the fishery, indicative operational costs and management costs. Average price data is available from the Sydney Fish Market. Landings data are available through the catch returns submitted by fishers. Indicative data on operational costs will need to come from a variety of direct and indirect sources. NSW DPI will supply management cost information.	The Director-General of NSW DPI is satisfied that the gross value of production of the fishery has not exceeded the sum of indicative industry operational costs and government management costs relevant to the fishery for 3 consecutive years	High	This indicator provides a measure of economic viability of the fishery by monitoring the net returns to the fishery. Net return is a better indicator of economic performance than gross returns as it accounts for changes in fishers' costs over time. A process of determining indicative operational costs will need to be developed in consultation with the Seafood Industry Advisory Council and the MAC.
3	Gross value of lobster production (CPI adjusted) relative to the TACC	Data on landed volumes and prices (CPI adjusted) for commercial lobster catches are required. Average price data are available from the Sydney Fish Market and landings data are available through the catch records submitted by fishers.	Gross value of commercial catch (CPI adjusted) relative to the value of the full TACC if caught, decreases by more than 10% from the previous year	Medium	This indicator seeks to detect substantial reductions in the value of the actual catch taken versus the value of the total allowable catch permitted to be taken by the fishery
4	Average market value of lobster shares when traded	The market value of shares is collected and recorded by the Share Registrar upon each share transfer	Average annual share transfer price increases or decreases by more than 25% over two years	Medium	Market value of shares provides a general indication of investor's confidence in the economic viability of investing in the Lobster Fishery, as it takes into account a range of contributing factors

GOAL 6. Facilitate effective and efficient compliance, research and management of the Lobster Fishery					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	The percentages of total inspections which result in the detection of major (share forfeiture) or minor (all other) offences	Data requirements include a record of the number and types of offences committed and the compliance effort expended (eg. number of inspections). Data concerning the number and types of offences detected by Fisheries Officers are held in records kept by NSW DPI.	Percentage of inspections resulting in the detection of offences exceeds either of the following: (i) 20% for minor offences; (ii) 10% for major offences	Low	This indicator provides a simple low cost measure of compliance by lobster fishers with management rules. More sophisticated indicators and trigger points can be developed taking into account new data that may become available in the future.
2	Number of Lobster MAC meetings held each year	The number of Lobster MAC meetings held is available through records kept by NSW DPI	Number of Lobster MAC meetings is less than 2 in any calendar year, unless otherwise agreed by the Lobster MAC	Low	Holding two Lobster MAC meetings per year is currently a requirement of the FM (General) Regulation which ensures that regular stakeholder consultation is taking place and can lead to improved management outcomes
3	Reviews and outcomes of strategic plans for research and compliance in the Lobster Fishery	Data about frequency and outcomes of reviews required and available through records kept by NSW DPI	The research or compliance strategic plans expire without being reviewed by NSW DPI, or the strategic plans are not modified consistent with the approved outcomes of a review	Medium	Strategic plans focus research and compliance activities and help to ensure efficiency and cost effectiveness of the programs undertaken. It is important that they are reviewed and updated within the timeframes specified therein.

GOAL 7. Improve knowledge of the NSW Lobster Fishery and the resources upon which the fishery relies					
No.	Performance indicator	Data requirements & availability	Trigger point	Robustness	Justification/comments
1	Research work that contributes to filling information gaps identified by the environmental impact assessment for the fishery	Relevant data will be held by NSW DPI and/or external funding bodies	Research work has not been undertaken to fill identified information gaps within 5 years from the commencement of the strategy	Medium	The knowledge base of the Lobster Fishery will be improved if the information gaps identified by the environmental impact assessment are filled
2	Accuracy of catch return (logbook and monthly reporting) data	Requires commercial landings, marketing data and information on species identification. Information available from log books and monthly reconciliation forms submitted by fishers, Registered Fish Receiver data and through periodic observer surveys.	The accuracy of the reported data has not improved after every three year period	Medium	Improving the accuracy of data, in terms of quantity of product retained, species identification and completeness of records, is important for improving the knowledge base. Accuracy will be measured by undertaking comparisons with market records using a sample of endorsement holders and by comparison of data from periodic observer surveys.
3	Occurrence of port meetings conducted with fishers and fisheries officers	Records of port meetings held are kept by NSW DPI	No port meetings held in a year	Low	Port meetings provide for two-way communication between lobster fishers and NSW DPI on issues impacting on the Lobster Fishery (including operational, social and economical issues)

10.3 Reporting on the performance of the FMS

There are two types of performance monitoring reports to be prepared under this FMS. One is a performance report which reports generally on the performance of the fishery with respect to the FMS. The other type of report is a review report, which is to be prepared if a performance indicator for the fishery is breached. Both types of reports are discussed in further detail below.

10.3.1 Performance report

A performance assessment examining each performance indicator will be undertaken annually and a report on the performance indicators will be submitted to the Minister for Primary Industries within two years of the commencement of the FMS, and biennially thereafter. The report is the formal mechanism for reporting on performance indicators and triggers points and will be made publicly available. It will also include a review of progress made in implementing each of the management responses. The performance report may be submitted to the Minister for Primary Industries in conjunction with performance reports for other relevant fishery management strategies.

The vast majority of management responses in the FMS are linked to specified implementation timeframes. 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 for Primary Industries⁹.

The fishery will continue to be regarded as being managed within the terms of the FMS whilst any remedial measures associated with breaches in timeframes or triggering of performance indicators are being considered through the review process and/or by the Minister for Primary Industries.

10.3.2 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 Lobster 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.

The NSW DPI 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 the preparation of reports relating to performance monitoring in the FMS. 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 The NSW DPI. Where the data or information indicate that a trigger point has been breached, details will be provided to the relevant fishery MAC and the relevant Ministerial advisory councils. Consultation will then occur with the Lobster MAC and other relevant advisory bodies either through a meeting or out of session. During this consultation, advice will be sought on the suspected

⁹ In some circumstances a required action may be completed outside the scheduled timeframe, but prior to the commencement of the review. When this occurs, it is not necessary to proceed with a review.

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 Primary Industries within six months of the trigger point being breached.

Where economic, biological or ecological sustainability are factors for concern in a review, the review 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 FMS itself may be amended by the Minister for Primary Industries. 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 FMS 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. Although the Lobster Fishery is the only commercial fishery under NSW jurisdiction to take rock lobsters, the fishery does take other fish species as byproduct, where this rule may apply.

All review reports will be publicly available.

External Drivers

External drivers are factors that are known to potentially impact on the performance of the fishery but which are outside the control of The NSW DPI or the commercial fishing industry (e.g. market prices, pollution etc.). Any external influences that may contribute to a trigger being breached will be identified during the review and, if necessary, referred to any relevant managing agency for action.

Accordingly, there may be circumstances where no change to management arrangements or the FMS is deemed necessary following the review. For example, a review could be triggered because the landed catch of a species declines. However, there would be little cause for concern over the performance of the FMS if the decline in landed catch of a species was clearly caused by a drop in market prices. Any price fluctuations can result in fishers adjusting their activities.

10.4 Contingency plans for unpredictable events

In addition to the circumstances outlined above, the Minister for Primary Industries may order a review and/or make a modification to the fishing regulatory controls, administrative arrangements or the FMS in circumstances declared by the Minister as requiring contingency action, or upon the recommendation of the Lobster MAC. In the case of the former, the Minister for Primary Industries must consult the Lobster 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 for Primary Industries may also amend this FMS if matters identified during the finalisation of any other FMS indicate that a modification is necessary.

Notwithstanding the above, the Minister for Primary Industries may also make amendments to the FMS that the Minister considers to be minor in nature at any time.

10.5 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.

Two stock assessment models have been used in the Lobster Fishery, a biomass-dynamics model and a length based model. Both models are in the process of development and evaluation. The biomass dynamics model represents the total biomass in the population. The length-based model represents the length (and associated age) structure in the population, as well as the sexual difference in some key parameters. While the models provide critical information for assessment of the fishery, there are still several areas where improvements may be necessary, especially in the use of commercial catch rate information parameters (TAC Committee, 2002).

11. References

Note: articles that have not been externally peer reviewed and published in a journal or book are denoted with an asterisk (*).

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Appendices to the FMS

Appendix 1	Copy of the Minister's Determination made in respect of the Lobster Fishery under the <i>Environmental Planning and Assessment Act 1979</i>
Appendix 2	Implementation Table

Appendix 1. Copy of Minister's determination made under the EP&A Act

DETERMINATION WITH RESPECT TO A DESIGNATED FISHING ACTIVITY UNDER SECTION 115O OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

I, the Minister for Primary Industries, under section 115O of the Environmental Planning and Assessment Act 1979 ("the Act"), determine to permit the designated fishing activity referred to in Schedule 1 to be carried out subject to the modifications set out in Schedule 2.

I have required the modifications to reduce the detrimental effect of the activity on the environment.

I have examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the designated fishing activity.

I have considered *inter alia*:

1. the Environmental Impact Statement for the Lobster Fishery published by NSW Department of Primary Industries in December 2004 and the representations duly received with respect to the designated fishing activity to which the statement relates;
2. the views of the NSW Department of Planning and the Department of the Environment and Heritage;
3. the matters required to be considered under section 115N of the Act relating to threatened species conservation; and
4. the matters referred to in section 19(2) and section 20(3) of the Marine Parks Act 1997.

Dated this 1st day of March 2006.

Ian Macdonald MLC
Minister for Natural Resources
Minister for Primary Industries
Minister for Mineral Resources

SCHEDULE 1 Designated fishing activity:

Fishing activities for commercial purposes in the Lobster Fishery as described in Schedule 1 of the Fisheries Management Act 1994.

SCHEDULE 2 (Modifications)

The draft fishery management strategy exhibited in December 2004 as part of the Environmental Impact Statement for the designated fishing activity is revised so as to incorporate the amendments expressly stated in the *Summary of Submissions and Preferred Strategy Report for the NSW Lobster Fishery* dated December 2005.

Appendix 2. Implementation table

The following implementation table outlines the target time periods within which each management response detailed in the FMS is scheduled to be implemented. The table also provides information relating to the head of power for implementation and who has the lead responsibility for carrying out the action(s). A general description of the terms used in the table with respect to target timeframes are:

Term	Description
Immediate	Upon the time of approval of the strategy
Short term	Within one year of the time of approval of the strategy
Medium term	Within 3 years of the time of approval of the strategy
Long term	In excess of three years of the time of approval of the strategy
As required	Whenever the circumstances warrant action
Ongoing	Continuing into the future

Management responses in the table marked with an asterisk (*) indicate new management actions that are to be implemented.

Despite the target timeframes listed below, some programs may need to be reprioritised or rescheduled over time in order to direct the limited resources available for implementation to the most critical program areas for designated periods. This may involve prioritising programs within this FMS as well shared or separate programs scheduled in other fisheries. For example, it may be a better use of resources to temporarily divert funding originally targeted for fishery monitoring purposes into addressing some of the critical structural adjustment issues facing the fishery and the industry. One of the key factors to consider in any reprioritisation or rescheduling exercise is the level of relative environmental risk.

Appendix 2 Implementation table for the Lobster Fishery

Goal 1. Manage the Lobster Fishery in a manner that promotes the conservation of biological diversity in the marine environment					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
1.1 Mitigate the impact of lobster fishing on ecosystem integrity (species, populations and ecological communities)	(a) Prohibit commercial lobster fishers from taking species other than species of rock lobster in waters less than 10 m in depth	1, 4	Ongoing	NSW DPI	Regulatory
	*(b) Collect information on the number of traps in the fishery that are lost during fishing operations, and implement appropriate management actions that mitigate the risks of ghost fishing, as required	1, 6, 7	Short term and then as required	Lobster fishers NSW DPI	-
	*(c) Develop a code of practice for the Lobster Fishery in consultation with the Lobster MAC that is consistent, where appropriate, with the code of practice for the Ocean Trap and Line Fishery, including promoting the release of wobbegong sharks that are below 130 cm in length that are caught in lobster traps	1, 3, 4	Short term	NSW DPI Lobster MAC	Various
	(d) Use fishing closures to control fishing activities within the Lobster Fishery	1, 2, 3, 4, 6	As required	NSW DPI	Regulatory
	*(e) Map major lobster fishing grounds (including available information on associated geological features), assess the level of lobster fishing on each ground and define the areas in NSW waters open to lobster fishing (taking account of marine protected areas)	1, 2, 4, 6, 7	Long term	NSW DPI Lobster MAC Lobster fishers	-
1.2 Mitigate the impact of lobster fishing activities on non-retained species	*(a) Investigate the use of escape gaps in lobster traps to minimise the quantity of undersize lobsters captured, and implement the outcome of the investigation	1, 2	Medium term	NSW DPI	-
	(b) Implement a monitoring program to collect information on the quantity and composition of bycatch	1, 7	Ongoing	NSW DPI	To be determined
	(c) 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 (including threatened species populations)	1, 3	Ongoing	NSW DPI Lobster fishers	Various
	*(d) Use best-practice handling techniques, including the prohibition on the use of fish spikes, clubs or any other such implement that could unduly harm non-retained organisms	1, 3	Ongoing (Immediate for spikes)	NSW DPI Lobster MAC	Various

Goal 1 cont. Manage the Lobster Fishery in a manner that promotes the conservation of biological diversity in the marine environment					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
1.2 Mitigate the impact of lobster fishing activities on non-retained species	*(e) Investigate the use of fish escape panels in lobster traps set in waters deeper than 10 m with a minimum mesh size no smaller than the mesh size adopted in the Ocean Trap and Line Fishery to minimise bycatch and the retention of juvenile and small fish, and implement the outcome of the investigation	1, 2, 3	Medium term	NSW DPI	-
1.3 Mitigate the impact of activities within the fishery on marine and terrestrial habitat and their associated biota	(a) Modify the use of lobster fishing methods in areas where their use is identified as having a detrimental impact on fish habitat or associated biota	1, 3	As required	NSW DPI Lobster fishers	Various
1.4 Prevent the introduction and translocation of marine pests and diseases by lobster fishing activities	(a) Implement, in consultation with the Lobster MAC, measures required in accordance with any marine pest or disease management plans	1	As required	NSW DPI Lobster fishers	To be determined

Goal 2. Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
2.1 Maintain the spawning biomass of eastern rock lobster at or above 25 percent of pre-exploitation level	(a) The TAC Committee will determine the maximum weight of eastern rock lobster to be taken by the commercial Lobster Fishery	2, 5, 6	Ongoing	NSW DPI	FM Act Regulatory
	(b) Conduct an annual assessment of the eastern rock lobster resource including a review of the exploitation status of the stock and a risk assessment of alternative harvest strategies	2, 5, 7	Ongoing	NSW DPI	-
	(c) Develop models of the eastern rock lobster population and fishery	2, 5, 7	Ongoing	NSW DPI	-
	(d) Monitor catch and effort for eastern rock lobster in the commercial Lobster Fishery	2, 5	Ongoing	NSW DPI	Regulatory
	(e) Monitor the length and sex composition of commercial landings of eastern rock lobsters	2, 5, 7	Ongoing	NSW DPI	-
	(f) Monitor recruitment to the population of eastern rock lobsters	2, 5	Ongoing	NSW DPI	-
	(g) Monitor abundance and size-composition of the spawning stock of eastern rock lobsters	2, 5, 7	Ongoing	NSW DPI	-
2.2 Provide protection to components of the lobster stock to enhance biological sustainability	*(a) Provide enhanced protection to the eastern rock lobster spawning stock and in particular reduce the maximum size limit from 200 mm to 180 mm carapace length	2, 4, 5	Short term and then ongoing	NSW DPI	-
	(b) Prohibit taking eastern rock lobster below the minimum size limit or above the maximum size limit	2, 5	Ongoing	NSW DPI	Regulatory
	(c) Prohibit taking all female lobsters carrying ova	2, 5	Ongoing	NSW DPI	Regulatory
2.3 Effectively manage byproduct taken by the fishery	*(a) Limit lobster fishers to a defined list of species that can be retained as byproduct in the Lobster Fishery when working in waters deeper than 10 m	1, 2, 4, 6	Immediate	NSW DPI	Regulatory
	*(b) Develop a system, in consultation with the Lobster MAC, to provide for appropriate modifications to the list of byproduct species for the Lobster Fishery	2, 5, 6	Medium term	NSW DPI	-
	(c) Monitor, record and differentiate catches of species of rock lobster on log sheets in addition to eastern rock lobster	1, 2, 6, 7	Ongoing	Lobster fishers	-
	*(d) Modify the catch recording system to record and monitor landings of all other species taken in lobster traps (including sharks)	1, 2, 6, 7	Short term	NSW DPI Lobster fishers	-

Goal 2 cont. Maintain the stock of eastern rock lobster at a biologically sustainable level and manage byproduct taken in the Lobster Fishery					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
2.3 Effectively manage byproduct taken by the fishery	*(e) Utilise onboard observers to collect additional biological information, to facilitate estimation of size at maturity and fecundity/brood size data, for the elasmobranch species (i.e. wobbegong sharks, blind sharks, cat sharks and swell sharks) taken by the fishery	1, 2, 6, 7	As required	NSW DPI	-
	*(f) Implement changes to reduce the risk of the Lobster Fishery to wobbegong sharks, including: (i) daily trip limit, (ii) minimum legal length consideration, (iii) identification tools	1, 2, 7	i) Immediate, ii) As required, iii) Medium term	NSW DPI	Various
2.4 Promote the recovery of overfished species	*(a) Where the Lobster Fishery is a harvester of an overfished species, contribute to the development of any recovery program for the species, and adopt any measures required by a recovery program	1, 2, 4, 6	As required	NSW DPI Lobster fishers	Various

Goal 3. Promote the conservation of threatened species, populations and ecological communities and protected species likely to be impacted by the operation of the Lobster Fishery					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
3.1 Identify, and minimise or eliminate, any impact of lobster fishing activities on threatened species, populations and ecological communities (including mammals, birds, reptiles, fish, invertebrates and vegetation) and protected species, and where possible promote their recovery	*(a) Modify the mandatory reporting arrangements, in consultation with the Lobster MAC, to enable the collection of information on interactions with or sightings of threatened or protected marine species and interactions with other threatened or protected species	3, 7	Short term	NSW DPI Lobster MAC	Policy and/or Regulatory
	*(b) Implement, in consultation with the Lobster MAC, the provisions of any relevant threatened species recovery plan, threat abatement plan, priorities action statements or other similar management arrangements designed to protect threatened species and/or critical habitat areas	3, 6	As required	NSW DPI Lobster MAC	Various
	*(c) Using the code of practice, promote the use of fishing techniques that avoid the capture of, or interaction with, threatened species, protected species and fish protected from commercial fishing	3, 4	Short term and then ongoing	NSW DPI Lobster fishers	Voluntary

Goal 4. Appropriately share the resource and carry out fishing in a manner that minimises negative social impacts					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
4.1 Provide an appropriate allocation of the rock lobster resource between harvesting sectors, acknowledging the need of seafood consumers to access fresh quality product	*(a) Refine estimates of total catches of eastern rock lobster, taking into account commercial catch and estimates of recreational, Indigenous and illegal catches, for use in stock assessment models and reports to the TAC Committee	2, 4, 5, 7	Medium term and then ongoing	NSW DPI	-
4.2 Provide for fair and equitable sharing of the eastern rock lobster resource within the Lobster Fishery	(a) Limit the maximum shareholding in the fishery to 350 shares	4	Ongoing	NSW DPI	Regulatory
	*(b) Provide for the transmission of a shareholding to more than one person	4, 6	Short term	NSW DPI	Regulatory
4.3 Provide for fair and equitable management of the interactions between the Lobster Fishery and other commercial fisheries (NSW, interstate and Commonwealth)	(a) Use cross-fishery consultation to discuss and manage issues relating to, but not limited to, the multiple use of specific fishing grounds, collaborative research, fair and equitable access to stocks, complementary management arrangements and other interactions between fishing sectors	1, 2, 4, 5, 6, 7	Ongoing	NSW DPI	-
	*(b) Require the use of fish escape panels in lobster traps if it becomes evident that lobster traps are being used to target finfish	1, 4, 6	As required	NSW DPI	Regulatory
	(c) The NSW DPI will work cooperatively with staff from other jurisdictions (e.g. Commonwealth, Victoria, Tasmania, Queensland) regarding management, research and compliance arrangements for rock lobster species	2, 4, 5, 6, 7	Ongoing	NSW DPI	-
4.4 Identify and mitigate negative impacts of the Lobster Fishery on Aboriginal or other cultural heritage	(a) Manage the Lobster Fishery in a manner consistent with the Indigenous Fisheries Strategy and Implementation Plan	4	As required	NSW DPI	Various
	(b) Modify the activity, where relevant, in response to new information about areas or objects of cultural significance in order to minimise the risk from lobster fishing activities	4	As required	NSW DPI Lobster MAC Lobster fishers	Various
4.5 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 resource	(a) In consultation with the Lobster MAC, identify areas of high interaction between the Lobster Fishery and other resource users and respond appropriately to resolve any conflicts	4, 6	As required	NSW DPI Lobster MAC Lobster Fishers	Various

Goal 5. Promote a viable commercial fishery, consistent with ecological sustainability					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
5.1 Promote the long term economic viability of lobster fishing and assess the economic benefits of the fishery to the community	*(a) Investigate the application of minimum shareholding requirements for all shareholders to be eligible for an endorsement, in order to promote positive returns at the fishery level, and implement the outcome of the investigation	2, 5, 6	Medium term	NSW DPI	Regulatory
	*(b) Limit shareholders from acquiring, through quota transfer, more than 100 per cent of the amount of his or her initial quota allocation for the fishing period	4, 5, 6	Ongoing	NSW DPI	Regulatory
	(c) Allow for the storage of live eastern rock lobsters	4, 5	Ongoing	NSW DPI	Regulatory
	(d) Identify and promote harvest and post-harvest practices that ensure the best return in dollars per kilogram for product taken in the fishery, within the context of the fishing regulatory controls that apply to harvesting	5	Ongoing	NSW DPI Lobster fishers	-
	*(e) Refine the performance indicator for monitoring trends in the commercial viability of typical fishing businesses within each designated commercial fishing activity, so as to be based on net returns	5, 6, 7	Medium term	NSW DPI	-
	*(f) Investigate the data available to assess the economic multiplier (flow-on) effects of commercial fishing, including the Lobster Fishery, to the broader community, and develop strategies to improve the quality/usefulness of such data	4, 5, 7	Medium term	NSW DPI	-
	(g) Collect information to detect patterns in the quantity and price of share transfers and the quantity of quota traded, and investigate the feasibility of collecting data on the price of quota traded	4, 5, 7	Ongoing	NSW DPI Lobster MAC	-
5.2 Maximise the efficiency of trading quota	*(a) Investigate the feasibility of implementing an exchange accessible by all lobster shareholders transferring quota and implement the outcomes of the investigation	4, 5, 6	Ongoing	NSW DPI	-
5.3 Appropriately manage food safety risks in the harvesting of fish in the fishery	(a) Co-operate with the NSW Food Authority in the development and implementation of food safety programs relevant to the fishery	5, 6	Ongoing	Lobster fishers	FP Act

Goal 6. Facilitate effective and efficient compliance, research and management of the Lobster Fishery					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
6.1 Ensure a transparent and focused approach to compliance, research and management of the Lobster Fishery	(a) Utilise and review, in consultation with the Lobster MAC and key stakeholders, the compliance strategic plan and update where appropriate	1, 2, 4, 5, 6	Ongoing	NSW DPI	Policy
	(b) Utilise and review, in consultation with the Lobster MAC and key stakeholders, the research strategic plan and update where appropriate	1, 2, 3, 5, 6, 7	Ongoing	NSW DPI	Policy
6.2 Maximise compliance in the Lobster Fishery	*(a) Utilise, review and amend (where appropriate) the share forfeiture scheme based on demerit points, following the implementation of an endorsement suspension/share forfeiture scheme in other NSW share management fisheries	2, 5, 6	Ongoing	NSW DPI	Regulatory
	(b) Require all eastern rock lobsters taken in the Lobster Fishery to have an approved tag attached	2, 6	Ongoing	NSW DPI	Regulatory
	*(c) Investigate the feasibility, and implement the outcome, of introducing: (i) a requirement that lobster fishers include tag numbers of marketed lobsters on prescribed records to enable effective auditing; and (ii) arrangements for validating daily lobster landings and other catch and effort data to improve the robustness of the data, where necessary	2, 5, 6	Short term	NSW DPI	To be determined
	*(d) Introduce a requirement that the marking required on each lobster trap to indicate the position of the trap must include (in clearly legible figures which are no less than 50 mm in height): (i) the fishing business (FB) number of the fishing business with which the traps are associated, and (ii) the letter "L" (for lobster trap)	2, 6	Long term	NSW DPI	Regulatory
	*(e) Develop strategies to support appropriate practices and behaviour in commercial fisheries, including development of training and accreditation courses in core competencies and the introduction of fit and proper person requirements	All	Long term	NSW DPI Lobster MAC	Various

Goal 6 cont. Facilitate effective and efficient compliance, research and management of the Lobster Fishery					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
6.3 Provide effective and efficient communication and consultation mechanisms for the Lobster Fishery	(a) Utilise key consultative bodies, such as the Lobster Management Advisory Committee (MAC) when undertaking industry consultation on all aspects of the Lobster Fishery	2, 5, 6	Ongoing	NSW DPI	Policy and/or Regulatory
6.4 Implement this Strategy in a manner consistent with related Commonwealth and State endorsed programs aimed at protecting aquatic environments, and achieving the objectives of ecologically sustainable development	(a) Manage the Lobster Fishery consistently with other jurisdictional or natural resource management requirements, such as the marine parks program, aquatic biodiversity strategy, threatened species program, Indigenous Fisheries Strategy and other relevant strategies	1, 3, 4, 5, 6	Ongoing	NSW DPI	Various
	(b) Provide for the issue of permits under section 37 of the <i>Fisheries Management Act 1994</i> authorising modified fishing practices to assist research programs or for purposes consistent with the vision and goals of this FMS	All	Ongoing	NSW DPI	FM Act

Goal 7. Improve knowledge of the Lobster Fishery and the resources upon which the fishery relies					
OBJECTIVES	MANAGEMENT RESPONSES	CONTRIBUTES TO GOALS	TIMEFRAME	RESPONSIBILITY	AUTHORITY
7.1 Improve the community's understanding of commercial lobster fishing	(a) Contribute to the ongoing education of shareholders through advisory programs and port meetings	All	As required	NSW DPI	-
	(b) Promote awareness of the Lobster Fishery as part of the overall communication strategy across all commercial designated fishing activities by implementing issue-focussed education programs	4, 6, 7	Ongoing	NSW DPI Lobster MAC	-
7.2 Promote scientific research and monitoring to gain knowledge of eastern rock lobster, byproduct and bycatch species and the impacts of fishing on other species and the environment, and the status of the fishery as a whole, including economic and social factors	(a) Undertake research programs in accordance with the research strategic plan for the Lobster Fishery	All	Ongoing	NSW DPI	-
	* (b) Develop a strategy, in consultation with the Lobster MAC and taking into account the information gaps outlined in the economic and social assessment in the Environmental Impact Statement, to identify the nature and causes of economic issues affecting the industry and develop objectives to address these issues and promote effective structural adjustment in the fishery	4, 5, 7	Medium term	NSW DPI	-
7.3 Maintain and improve the quality of the catch and effort information collected from endorsement holders	(a) Require every commercial fisher endorsed in the Lobster Fishery to make a record of all rock lobsters taken each day (i.e. daily log books) and each month (i.e. monthly reconciliation forms) and send a copy to the NSW DPI within seven days following the end of the day fished and within seven days after the end of the month (respectively)	1, 2, 4, 6, 7	Ongoing	NSW DPI	Regulatory
	(b) Periodically review, in consultation with the Lobster MAC, the mandatory catch and effort return forms submitted by lobster fishers and implement changes if the data collected is perceived to be insufficient for monitoring and assessment purposes	1, 2, 4, 6, 7	Ongoing	NSW DPI Lobster MAC	-
	* (c) Assess the accuracy of species identification recorded in catch records and provide advice to industry to make needed changes	1, 2, 3, 4, 6, 7	Medium term	NSW DPI Lobster MAC	-