D4 The Harvest Strategy

D4.1 Extent of the Fishery

D4.1.1 Number of operators

In January 2004 there were 161 shareholders in the fishery with shareholdings ranging from 12 to 259 (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. In January 2004, 149 fishers were endorsed in the Lobster Fishery. Of these, 123 were shareholders with their own endorsement and the remaining 26 were nominated fishers. Shareholders may also choose to not fish some or all of their lobster quota but lease it to other shareholders in the fishery.

This management strategy 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.

D4.1.2 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 nautical miles and those Commonwealth waters within the jurisdiction of NSW under the Offshore Constitutional Settlement[16] (see Table D4.1). 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, including marine parks and aquatic reserves, there are currently no fishery specific area closures in place.

D4.1.2.1 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 NSW Department of Primary Industries 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 NSW Department of Primary Industries to identify and prioritise sites that may

[16] An offshore constitutional settlement was reached between NSW and the Commonwealth in 1991 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).

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.

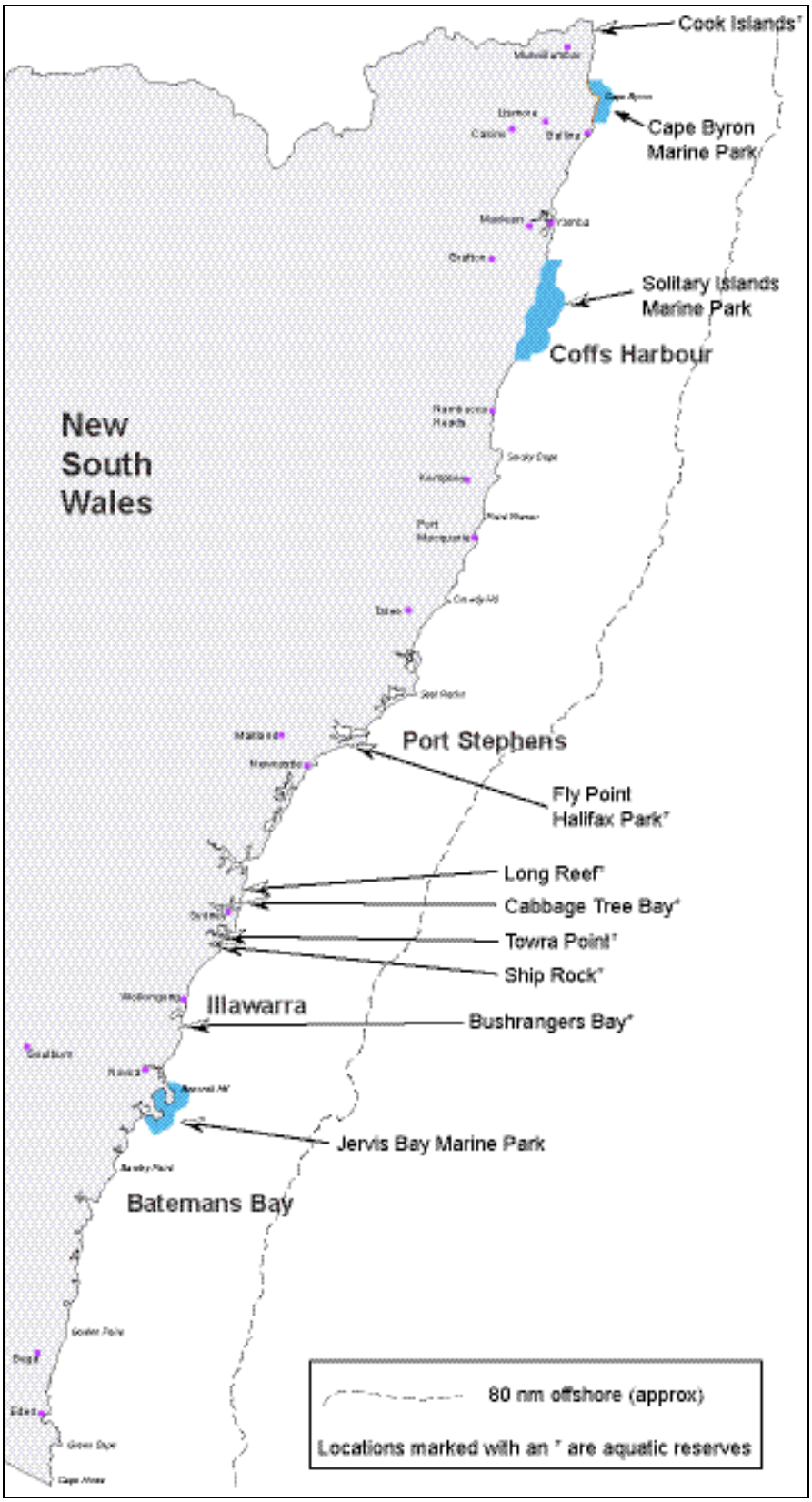

Figure D4.1 Map of the area of the Lobster Fishery including identification of major regional districts, and marine parks and aquatic reserves where lobster trapping is (or likely to be) limited.

D4.1.3 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.

D4.1.4 Fishing gear used in the fishery

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 D4.1. 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 D4.1 Dimensions of commercial lobster traps to be used in the Lobster Fishery.

Waters	Description		
	Base	Height	Mesh
Any waters (other than inland waters and any waters more than 10 metres deep (contour))	Rectangular base ≤1.2 m by 1.2 m (if circular, ≤1.2 m in diameter)	Not defined	Not defined
Ocean waters more than 10 m deep (contour)	≤2 m in length and ≤2 m in width	≤2 m	≥50 mm (measurement from one plain wire to the opposite plain wire)

D4.1.5 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). Management response 1.1.e in section D3 of this management strategy 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. Management response 4.5a also proposes to identify, in consultation with the Lobster MAC, areas of high interaction between the Lobster Fishery and other resources 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 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 Department of Primary Industries, this strategy promotes adherence to OH&S requirements and cooperation with the relevant authorities.

D4.1.6 Boats used in the fishery

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 4.3 of this management strategy for boat licensing arrangements).

D4.1.7 Storage of live rock lobsters

Lobster fishers may store live rock lobsters in clearly identifiable holding pens which are sealed (do not allow lobsters in or out) and do not exceed the dimensions of a commercial lobster trap which is 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.

D4.2 Species

D4.2.1 Species to be taken in the Lobster Fishery

Target species

The only target species in the Lobster Fishery is the eastern rock lobster (*Jasus verreauxi*). Section B2.3 of this EIS describes the biology and ecology of eastern rock lobster.

D4.2.1.1 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 D4.2 Rock lobster byproduct species taken by the Lobster Fishery.

Common name	Scientific name
Southern rock lobster	*Jasus edwardsii*
Painted rock lobster	*Panulirus* spp.

Endorsement holders can not, while trapping waters less than 10 m 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 D4.3 as byproduct, in addition to the rock lobster species listed in Table D4.2. However, fishers holding endorsements in both the Lobster Fishery and Ocean Trap and Line Fishery (i.e. 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 2.3d in section D3 of this management strategy).

Table D4.3 Byproduct species (other than rock lobster species) permitted to be taken by lobster fishers when trapping in waters deeper than 10 m.

Common Name	Taxanomic Name
Bar cod	*Epinephelus ergastularius*
Blind shark	*Brachaelurus waddi*
Catfish	PLOTOSIDAE spp.
Catsharks, Swellsharks	SCYLIORHINIDAE spp.
Crimson-banded wrasse	*Pseudolabrus gymnogenis*
Cuttlefish	*Sepia* spp.
Eastern red scorpioncod	*Scorpaena cardinalis*
Eastern wirrah	*Acanthistius ocellatus*
Foxfish, Pigfish	*Bodianus* spp.
Hermit crabs	PAGURIDAE spp.
Leatherjackets	MONACANTHIDAE spp.
Maori wrasse	*Ophthalmolepis lineolatus*
Ocean perches	*Helicolenus* spp.
Octopus	*Octopus* spp.
Redfish	*Centroberyx affinis*
Silver trevally	*Pseudocaranx dentex*
Slipper lobsters	*Scyllarides* spp.
Sweep	*Scorpis lineolatus*
Tasmanian trumpeter	*Latris lineata*
Wobbegong sharks	*Orectolobus maculatus,* *Orectolobus ornatus*

A minimum legal size limit is proposed to be implemented for wobbegong sharks through the draft Fishery Management Strategy for the Ocean Trap and Line Fishery. The size limit currently proposed under that draft strategy is 100 cm total length and may be adjusted based on future research results. The size limit would apply across all fisheries (including the Lobster Fishery) and is proposed to commence upon approval of the Ocean Trap and Line strategy. The Lobster MAC has recommended that the proposed minimum size limit for wobbegong sharks be increased to 120 cm total length to reduce the risk of the fishery on this species.

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. NSW Department of Primary Industries 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, however, NSW Department of Primary Industries will seek to establish a more formalised approach to joint management.

D4.2.2 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 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'.

D4.2.2.1 Non-retainable 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, berried and other eastern rock lobsters discarded each fishing day.

D4.2.2.2 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 D4.3, must be discarded. Although bycatch (other than eastern rock lobster) is not regularly reported by lobster fishers, the observer program (refer to management response 1.2b) will periodically collect information on the quantity and composition of bycatch into the future.

D4.2.3 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.

D4.2.4 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 D4.2). Lobster fishers are required to carry a suitable measuring device whilst operating in the fishery.

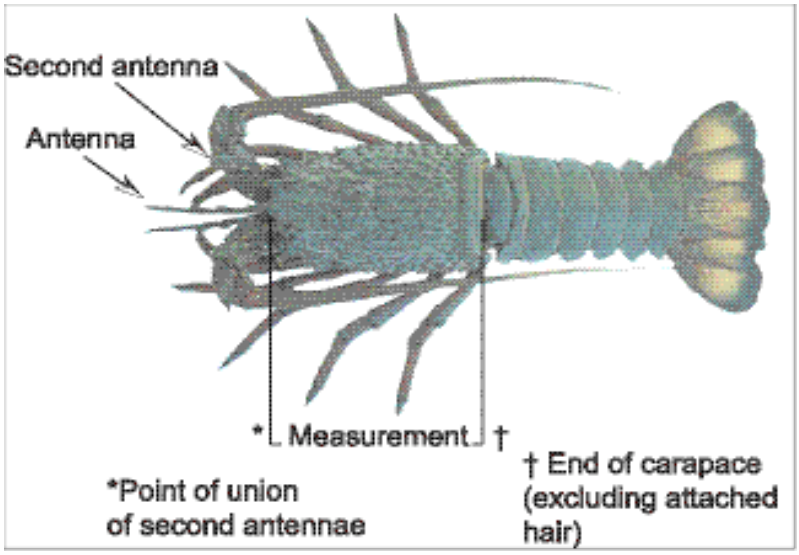

Figure D4.2 Measurement of carapace length of eastern rock lobster.

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 (refer to management response 2.2a). 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 at the smaller end of the legal size range 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 fishery management strategy for the Ocean Trap and Line Fishery includes the implementation of a minimum legal size for wobbegong sharks which are permitted to be retained by lobster fishers operating in waters deeper than 10 m. When it takes effect, this size restriction will apply to all fishers in NSW.

D4.2.5 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 3.1c). 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.

D4.2.5.1 Interactions with threatened species and protected species

Although interactions with threatened and protected species have not been formally recorded in this fishery, this management strategy 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 1.2b). Secondly, a modification to the monthly reconciliation forms will incorporate reporting fishers' interactions with protected and threatened species during fishing operations (see management response 3.1a).

A number of management responses also appear in section D3 of this management strategy, 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 3.1b) and the use of closures to avoid direct interactions when necessary (management response 1.1d).

D4.2.6 Status of the stock

NSW Department of Primary Industries 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 D4.4 to describe the stock status.

Table D4.4 Definitions of exploitation status of fish stocks.

Exploitation status	Definition
Under fished	The appraisal of a fish stock that suggests that the stock has the potential to sustain catches significantly higher than those currently being taken
Moderately fished (sustainable)	The stock is assessed to be fished at levels which would probably allow only limited increases in catches
Fully fished (sustainable)	The appraisal of a stock which suggests that current catches are sustainable and close to optimum levels (the definition of which may vary between fisheries; e.g. catches are close to maximum sustainable yield, or fishing effort is close to a biological reference point). In a fully fished fishery, significant increases in fishing effort above current levels may lead to overfishing
Overfished (growth/recruitment)	The appraisal suggests that current fishing levels may not be sustainable, and/or yields may be higher in the long term if the fishing level is reduced in the short term. This may be due to recruitment overfishing, growth overfishing and/or as a result of habitat degradation *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* occurs when fishing pressure has reduced the ability of a stock to replenish itself.
Uncertain	There is little or no information about the status of this stock (e.g. no catch data or only very recent catch data)
Unknown	The only information about the status of this stock is long term fishery dependent catch data

Table D4.5 outlines the current status of the target and byproduct[17] species taken in the Lobster Fishery. A number of species are classified as "unknown" and "uncertain". This strategy includes responses to measurably improve the quality of reported information on byproduct species, including amending the catch reporting system to record all byproduct species.

Table D4.5 Exploitation status of target and byproduct species taken in the Lobster Fishery.

Target/Byrproduct Species	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	Uncertain *
	Redfish	Overfished (growth)
	Leatherjackets	Uncertain *
	Octopus	Uncertain *
	Blind shark	Unknown
	Silver trevally	Overfished (growth)
	Eastern red scorpioncod	Unknown
	Cuttlefish	Uncertain *
	Tasmanian trumpeter	Unknown
	Catsharks, Swellsharks	Uncertain *
	Eastern wirrah	Unknown
	Catfish	Uncertain *
	Maori wrasse	Unknown
	Bar cod	Fully fished
	Crimson-banded wrasse	Unknown
	Ocean perches	Uncertain *
	Foxfish, Pigfish	Uncertain *
	Sweep	Unknown

* Indicates that the species composition of the catch needs to be better determined before any assessment of status can be made.

D4.2.7 Overfished species

If a species taken in this fishery is determined as 'overfished', this management strategy requires the implementation of, or assistance in developing, a recovery program for that species (see management response 2.4a). However, a recovery program is not required for species that are determined as growth overfished if the Director-General, NSW Department of Primary Industries, 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 NSW Department of Primary Industries preparing a summary of the known factors that have led to the determination of 'overfished' being made. In addition to the summary, a range of management options 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 management strategy for the

[17] 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 (refer to Table D4.3).

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.

D4.2.7.1 Definitions of overfished status

There are two types of overfishing which, when detected, in most cases require management action. It is important to note that the two are not mutually exclusive. "Growth overfishing" occurs when individual fish are typically harvested before the size that takes best advantage of the species growth in relation to expected natural mortality. "Recruitment overfishing" can be far more serious and occurs when fishing pressure has reduced the ability of a stock to replenish itself.

D4.2.7.2 Designation of a species as overfished

The information needed to clearly determine that a species has been growth overfished is more likely to be available than the information needed to detect recruitment overfishing. Most formal definitions of recruitment overfishing are determined on the basis of an understanding of relative rates of fishing mortality, population growth and population biomass as well as the relationship between spawners and recruitment (e.g. Hilborn and Walters, 1992). Even the most thoroughly studied species in NSW may not have relevant information on all those topics.

NSW Department of Primary Industries will consider advice from fisheries scientists as part of the annual assessment of the status of fish stocks in NSW, or as a result of a review arising from a trigger point breach (see section D5 of this management strategy). That advice could come as results of internal research become available, or from other agencies doing research relevant to assessment of species harvested in NSW. If the species is the subject of a formal stock assessment process, 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 NSW Department of Primary Industries, NSW Department of Primary Industries fisheries scientists will review the status determination for that species against the criteria specified in Table D4.4 and report on the updated status. If a species is designated as overfished, a recovery program involving all harvest sectors will be developed.

D4.2.7.3 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.

Recovery programs for species suspected of having depressed recruitment due to overfishing 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.

D4.2.7.4 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 in this strategy to be developed and implemented by the Lobster Fishery.

There are currently two species, taken as byproduct in the Lobster Fishery, considered growth overfished. These are 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 South East Trawl Fishery (SETF) is considered the major harvester of redfish, and should a recovery program be implemented within the Commonwealth fishery, the NSW Lobster Fishery is committed to implement any relevant provisions of such a program.

The stock assessments available for redfish taken in the Commonwealth SETF indicate the stock is growth overfished. Cod-end regulations will be introduced under the Fishery Management Strategy 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 management strategy to provide for the quantity of all byproduct species taken in this fishery to be recorded (see management response 2.3d). Following collection of such information for a period of two years, an assessment of whether any direct action is required under the Lobster Fishery Management Strategy to assist the recovery of redfish, may be required.

The Ocean Trawl Fishery Management Strategy 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.

D4.3 Management Controls and Administration

D4.3.1 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. Following the finalisation of the Fishery Management Strategy (FMS) for the Lobster Fishery, the FM (Lobster SMP) Regulation will be reviewed and updated.

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.

D4.3.2 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 (i.e. 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 5.1a in section D3 of this management strategy will investigate the introduction of a minimum shareholding applicable to all shareholders in the Lobster Fishery.

D4.3.3 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) was requested to investigate 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 management strategy 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 management strategy as a result of the environmental assessment process will need to be fully funded by the fishery participants.

D4.3.4 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 fishery[18]. 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 5.1b limits the amount of quota a shareholders may acquire through quota transfer during each fishing period.

D4.3.4.1 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 considers harvest estimates from other sectors, including recreational and illegal catch estimates (by both commercial and non-commercial fishers), when setting the TACC. Before the TAC Committee makes a 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.

[18] Shareholders who cannot actively take their share of the quota due to the minimum share holding requirement may still transfer their quota to other lobster fishers.

D4.3.5 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 fishery 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.

D4.3.6 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 four weeks, unless otherwise approved by the Director- General, NSW Department of Primary Industries.

Nominated fishers are endorsement holders in the fishery and are therefore subject to a conviction record check upon application. They 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.

D4.3.7 Crew

To assist an endorsement holder in the Lobster Fishery one must either hold a commercial fishers licence or hold a current crew registration. All crew must be recorded on the daily log sheet. An application for crew registration must be recommended by a fisher endorsed in the Lobster Fishery and can be refused if the applicant has been convicted of a State or Commonwealth fisheries offence in the three years prior to submitting the application.

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

D4.3.8 Commercial 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 rules.

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 authorisation are permitted to operate in ocean waters beyond 3 nm.

D4.3.9 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 commercial fishing licence is not renewed within 60 days of the expiry date on the licence, the renewal application is generally taken to be an application for a new licence. Additional fees apply to late renewal applications.

D4.3.9.1 Abeyance period for fishing boat licences

Fishing boat licences can be held in abeyance for a period of up to two years from the date of expiry of the licence or when advised in writing by the owner. Fishing boat licence fees are not payable during the period of abeyance, but the full amount due is payable if the licence is reinstated within the two years specified.

D4.3.10 Appeal mechanisms

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

The main role of the ADT is to review administrative decisions of NSW government agencies. To lodge an appeal with the ADT, a request must first be made to NSW Department of Primary Industries 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/

D4.3.11 Code of practice

This management strategy 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 1.1c).

D4.3.12 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 1.1d). 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 Department of Primary Industries' website at: www.dpi.nsw.gov.au

D4.3.13 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.

D4.3.14 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 NSW Department of Primary Industries 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 rock lobster species landed
- crew and boat (if any) details
- validated weight of landed lobsters
- holding pen location details
- tag numbers used
- quantity of eastern rock lobster discarded (berried, undersized, oversized and other)

Lobster fishers must complete and forward to NSW Department of Primary Industries 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 3.1a), recording all byproduct taken in the fishery (management response 2.3d) and recording loss of traps (management response 1.1b).

D4.3.15 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 NSW Department of Primary Industries 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. NSW Department of Primary Industries must receive written advice of any lost, stolen or destroyed tags. Unused tags must be returned to NSW Department of Primary Industries at the end of the fishing period.

D4.3.16 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. The minimum number of shares required by a new entrant to gain an endorsement in the fishery is currently 55 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 rock lobster shares to one or more persons (see management response 4.2b). Share transactions may be refused for a number of reasons, such as:

- 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 offence[19] in the previous three years.

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

All rock lobster 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.

D4.3.17 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 impacted by a number of factors including the costs attributable to the development of the fishery management strategy 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 2007. An independent economic review of the fishery will occur by 2007, with future community contributions based on the outcome of the review.

D4.3.18 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.

D4.3.19 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 management strategy (see management response 5.3a).

D4.4 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. NSW Department of Primary Industries 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.

[19] 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*.

Approximately 75 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.'*

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

The district plan for the location sets out the percentage of available time officers from that office will spend on particular compliance duties. All coastal fisheries offices in NSW focus a set number of resources toward achieving optimal levels of compliance in the 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 Total Allowable Commercial Catch (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.

NSW Department of Primary Industries 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 D4.6 outlines the various compliance plans relevant to the Lobster Fishery.

Table D4.6 Compliance plans relevant to the Lobster Fishery.

Plan	Description	Reviewed
NSW Compliance Plan	Overarching framework that identifies priorities and objectives for compliance throughout the State	Every 3 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 (ie. Commerical and recreational lobster compliance services)	Annually

D4.4.1 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 D4.7). 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 6.2a).

Table D4.7 Share forfeiture offences in the Lobster Fishery.

Share forfeiture offence	Description	Number of 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 FM (General) Regulation	Interference with set fishing gear	3
Any offence under the FM Act or Regulation that is punishable by imprisonment		3

Note. Clause 133 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.

D4.5 Research

D4.5.1 Strategic research plan

NSW Department of Primary Industries has developed a strategic research plan covering priorities across all fisheries which is responsive and takes account of the research requirements identified under each fishery management strategy. Table D4.8 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 D3.2 of this management strategy 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, 2001, 2002, 2003). 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 NSW Department of Primary Industries and priorities identified in this management strategy. While applications are submitted for external funding, lobster shareholders fund the majority of the research conducted for the fishery.

D4.5.2 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 Department of Primary Industries' 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.

NSW Department of Primary Industries 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 (i.e. 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 NSW Department of Primary Industries.

Meetings with representatives from the Lobster MAC, NSW Department of Primary Industries 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 D4.8 Research priorities in the Lobster Fishery at the commencement of the fishery management strategy.

Research Project	Priority	Aims & comments	Related management 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, 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	2.1d
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	2.1e
Observer-based survey of the magnitude and species composition of byproduct and bycatch	Medium	**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 (1999-00 to 2001-02) in conjunction with the observer survey for size structure of rock lobster. This observer work will be conducted periodically and will also collect biological information for the elasmobranch species taken by the fishery	1.2b, 2.3e
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	2.1g

Table D4.8 continued

Research Project		Aims & comments	Related management responses
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)	2.1g
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 form 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)	2.1b,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	4.1a
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	4.1a
Investigation of the mortality of under-size lobsters resulting from capture and discard and the use of escape gaps to minimise the quantity of under-sized lobsters captured	Medium	**Investigate the use of escape gaps 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 gaps 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	1.2a

Table D4.8 continued

Research Project		Aims & comments	Related management responses
Investigations of the impacts of trap loss on mortality of lobsters and other species (ghost fishing)	Medium	**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**	1.1b
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	5.1d
Economic and social survey of lobster shareholders	High	**Economic and social survey to determine the economic and social components underlying the viability of lobster shareholders.** Previous studies of the viability of lobster operators relied on the results of a survey of a sample of fishing businesses for the 1999-00 financial year (Roy Morgan, 2001). 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	5.1e, g; 7.2b
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, there are only limited data 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	5.1f

D4.6 Consultation

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

D4.6.1 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 Department of Primary Industries representative and an Indigenous position. From 1 January 2005, the MAC will 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 NSW Department of Primary Industries 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.

D4.6.2 Ministerial advisory councils

Three 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. The Ministerial advisory councils currently established are:

- Advisory Council on Commercial Fishing (ACCF)
- Advisory Council on Recreational Fishing (ACoRF)
- Advisory Council on Aquaculture (ACoA).

The Lobster Fishery and each of the other major share management fisheries have representatives on the ACCF. 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 in December 2003 and is likely to result in changes to the existing advisory structure. The name and

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

D5 Performance Monitoring and Review

D5.1 Performance monitoring

Many of the management responses listed in section D3 of this fishery management strategy assist in achieving multiple goals. Therefore, rather than examining the performance of each individual response or objective, it is more efficient and appropriate to measure the performance of the management strategy against the 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.

D5.1.1 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 D5.2. 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 management strategy can be most effectively utilised. These will be further refined in light of the practical implementation of this management strategy.

D5.1.1.1 Data requirements and availability

The data requirements and availability for each performance indicator in Table D5.2 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.

D5.1.1.1 Robustness

The robustness ratings applied to each performance indicator in Table D5.2 have been selected using the definitions outlined in Table D5.1 below.

Table D5.1 Robustness classifications

(Source: SCFA, 2000)

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 acurate 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 invole surrogate indicators

D5.1.2 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 D5.3 for further information on reviews in response to trigger points).

Table D5.2 establishes the performance indicators and trigger points that will be used to measure whether each of the management goals described in section D3 of this management strategy are being attained. As the performance indicators defined in the FM (Lobster SMP) Regulation have been incorporated into Table D5.2, so have the triggers associated with them.

D5.2 Predetermined review of performance indicators and trigger points

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

A comprehensive review of the appropriateness of all performance indicators and trigger points will be carried out not more than two and a half years from the commencement of the management strategy, in consultation with the 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 D5.2 Performance indicators, data requirements and trigger points to measure the success of each of the goals of 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 and availability**	**Trigger point**	**Robustness**	**Justification/comments**
1	Species composition (for all byproduct and bycatch species in the fishery	Quantitative landings and discard data from monthly catch reporting and periodic onboard observer surveys	To be determined following review of the observer survey data relating to bycatch and two years of the fishery recording all byproduct	Medium	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	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 adhered to in 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 provides that management of the fishery will be responsive to existing or new marine pest or disease incursions that may threaten the biodiversity in the marine environment
3	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 Department of Primary Industries 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 minimising 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 and 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 2.3d	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 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.) 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 and availability**	**Trigger point**	**Robustness**	**Justification/comments**
5	Annual landings of wobbegong sharks by the Lobster Fishery	Quantitative landings data on wobbegong sharks from the catch reporting system	Lobster Fishery landings of wobbegong sharks exceeds 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 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
6	Commercial landings of hermit crabs	Quantitative landings data on hermit crab landings from catch reporting system	Commercial landings of hermit crabs exceed 30 tonnes	Medium	Observer studies indicate that hermit crabs are incidentally captured in large quantities (approximately 140 tonnes per year) by lobster traps, however most (approx. 83 %) are discarded. Discard mortality of hermit crabs is assumed to be negligible due to morphological characteristics (e.g. no swim bladder). As little is known about hermit crab biology, the management strategy needs to contain a trigger in the event that a viable market is found for this species in the future and fishers begin to retain a significant quantity

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					
No.	**Performance indicator**	**Data requirements and availability**	**Trigger point**	**Robustness**	**Justification/comments**
1	Interactions which may threaten the survival of 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 the periodic observer surveys	Any interaction which may threaten the survival of a threatened species, population or ecological community	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. Every interaction recorded will be referred to the Threatened Species Unit to determine whether the interaction is likely to threaten the survival of a threatened species, population or ecological community
2	Interactions which may threaten the survival of a protected species	Data will be obtained through catch reporting provided by endorsed lobster fishers. Consideration will also be given to any data collected through the periodic observer surveys	An annual review of interactions determines that the level of interaction may threaten the survival of a protected species	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. The Threatened Species Unit 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

GOAL 4. Appropriately share the resource and carry out fishing in a manner that minimises negative social impacts					
No.	**Performance indicator**	**Data requirements and availability**	**Trigger point**	**Robustness**	**Justification/comments**
1	Proportion of eastern rock lobster taken by the commercial sector relative to all non-commercial 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	Relative catch between commercial and non-commercial sectors shifts by 25% or more between year 1 and year 5 values following the commencement of the FMS and then every five year period thereafter	High	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, however, a trigger point can be specified that will detect a relatively large shift in catch over time between the commercial sector and other stakeholder sectors
2	Quantity and composition 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 2.3d, 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 and 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	Median gross return of fishing businesses with a lobster endorsement	Data on average market price of fish (CPI adjusted), and total commercial landings by each lobster business are required. Average price data are available from the Sydney Fish Market and landings data are available through the catch returns submitted by fishers	Median gross return (CPI adjusted) decreases by more than 5% from the previous year	Medium	This indicator provides a measure of the central tendency of gross returns from fishing (i.e. the median), rather than the average return, because of the tendency for the average to be skewed by more extreme observations (i.e. the distribution of fishing returns is not normal). Gross, rather than net return, is used because data on the costs of fishing are not readily available. Management response 5.1e seeks to refine this indicator so as to be based on net returns. The trigger point should not be interpreted as the gross return of individuals increasing by that amount
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 returns submitted by fishers	Value of commercial catch (CPI adjusted) relative to the TACC decreases by more than 10% from the previous year	Medium	The previous indicator provides a measure of gross returns to fishing businesses with a lobster endorsement, taking into account catches from other commercial fisheries. In this indicator, gross returns from the Lobster Fishery are considered separately
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 and 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 (e.g. number of inspections). Data concerning the number and types of offences detected by Fisheries Officers are held in records kept by NSW Fisheries	Percentage of detections of minor offences is 20% or more; detection of major offences is 10% or more	Medium	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 Fisheries	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 Fisheries	The research or compliance strategic plans expire without being reviewed by NSW Fisheries, 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 and 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 Fisheries 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 Fisheries	No port meetings held in a year	Low	Port meetings provide for two-way communication between lobster fishers and NSW Fisheries on issues impacting on the Lobster Fishery (including operational, social and economical issues)

D5.3 Reporting on the performance of the management strategy

There are two types of performance monitoring reports to be prepared under this management strategy. One is a performance report which reports generally on the performance of the fishery with respect to the management strategy. 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.

D5.3.1 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 trigger 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 management strategy 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 Industries[20].

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

D5.3.2 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.

NSW Department of Primary Industries 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 management strategy. This does not, however, prevent a review from being conducted at any other time should it become apparent that a performance indicator has breached a trigger point.

Once the relevant information is obtained an initial analysis against the trigger points will be undertaken by NSW Department of Primary Industries. 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

[20] In some circumstances a required action may be completed outside the scheduled timeframe, but prior to the commencement of the review (e.g. an action was due for completion by September 2004, but it is actually completed in October 2005). When this occurs, it is not necessary to proceed with a review.

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 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.

Reviews arising from landings data exceeding trigger points should consider, but not be limited to, the following factors:

- changes in the relative catch levels among harvest sectors (including those beyond NSW jurisdiction)
- new biological or stock information (from any source) available since the most recent review of the species
- changes in the activities or effectiveness of fishing businesses targeting the species
- changes in principal markets or prices for the species
- environmental factors.

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

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

If a review considers that the management objectives or performance monitoring provisions are inappropriate and need to be modified, the management strategy 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 fishery management strategy that allows harvesting of that species. This approach to the review process will avoid triggering multiple reviews for a species which is caught in multiple fisheries. 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.

D5.3.2.1 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 NSW Department of Primary Industries 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 management strategy is deemed necessary following the review. For example, a review could be triggered because the landed catch of a species declines. However, there would be little cause for concern over the performance of the management strategy if the decline in landed catch of a species was clearly caused by a drop in market prices. Any price fluctuations can result in fishers adjusting their activities.

D5.4 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 management strategy 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 fishery management strategy if matters identified during the finalisation of any other fishery management strategy indicate that a modification is necessary.

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

D5.4 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).

FMS Appendix 1 - Implementation table for the Lobster Fishery

The following implementation table outlines the time periods within which each management response detailed in the fishery management strategy 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 timeframes are:

Term	Description
Immediate	Upon the time of approval of the strategy
Short term	Within one year of the date of approval of the strategy
Medium term	Within 3 years of the date of approval of the strategy
Long term	In excess of three years of the date 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.