Volume 2

Chapters C - G

This is the second of three volumes of the Environmental Impact Statement on the Lobster Fishery in NSW

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CHAPTER C CONSIDERATION OF ALTERNATIVE MANAGEMENT REGIMES

This chapter highlights a range of high-level alternatives to the existing operation of the fishery described in Chapter B.

C1 Alternative: no Lobster Fishery

This section presents the consequences of not having a commercial lobster fishery in NSW. The Lobster Fishery exists because it satisfies a number of significant community needs, each of which are discussed under separate headings below. First, consideration must be given to the fate of eastern rock lobster and its ecosystem if there was no Lobster Fishery.

Not having a Lobster Fishery would reduce the fishing mortality of eastern rock lobster and to a lesser extent the byproduct species associated with the fishery. This would reduce the pressure on the spawning stock, reduce the disturbance of undersized lobsters in inshore waters, increase eastern rock lobster biomass and may improve catches by recreational and Indigenous fishers.

If there was no commercial Lobster Fishery in NSW it could be expected that there would be fewer disturbances of species and communities that make up the incidental catch in lobster traps and as a result catches of some byproduct and bycatch species (e.g. leatherjacket, snapper) may increase in other fisheries. However, given the relatively small quantity of byproduct and bycatch caught in the Lobster Fishery, it is unlikely that closure of the fishery would impact significantly on the overall abundance of those species or catches in other fisheries.

From an ecosystem perspective, the absence of commercial lobster fishing may help to conserve biodiversity in the ocean waters where the fishery currently operates. However, while believed to be small (particularly in comparison with other fishing and non-fishing activities), the scale of the impact of the Lobster Fishery on the ecosystem is not known. There is likely to be less disturbance of benthic and epibenthic communities and of those species which make up the incidental catch of the Lobster Fishery. There may also be additional quantities of food available for predators of rock lobster (e.g. octopus).

The potential benefits of not having a Lobster Fishery, however, need to be balanced against the negative impacts. The fishery creates significant employment opportunities and provides substantial economic benefits to coastal communities. Also, because of the low abundance of eastern rock lobster in other States, the NSW Lobster Fishery is the only commercial fishery in Australia that targets this high value species. Accordingly, not having a Lobster Fishery in NSW would have considerable social and economic impacts, not only on the shareholders and others directly employed by the fishery, but also on regional communities in some areas of coastal NSW (see sections C1.2 & C1.3 below).

If the fishery was closed, the potential for increased illegal lobster fishing (and black marketing) to satisfy the consumer demand would rise, thereby reducing the potential benefits for the eastern rock lobster stock. Furthermore, the government would be likely to need to direct additional resources into enforcement programs designed to prevent an escalation in illegal fishing for lobster, at the expense of other programs.

C1.1 Supply of seafood to the community

Over the past seven years the Lobster Fishery has provided, on average, over 100 tonnes of eastern rock lobsters annually for general consumption by the community and for export to overseas consumers. The supply of shellfish and finfish to local markets by commercial fishers satisfies demand from Australian consumers who do not wish to, or are unable to, venture out and catch the fish themselves. Fresh seafood enjoys a reputation as a healthy source of high-quality protein and beneficial nutrients (e.g. Omega-3 fatty acids) and has a central place in the 'Australian lifestyle'.

A survey of the importance of local seafood to the catering and tourism industries in NSW has shown that 40% of businesses felt it was important to offer NSW caught seafood to visitors. Fifty percent of businesses promote the local product (Ruello, 1996). A repeat survey four years later indicated that this trend has continued to increase and the importance of fresh local seafood to both consumers and businesses has increased (Ruello & Associates Pty Ltd, 2000). There is a strong market demand for eastern rock lobster as a high value seafood product.

The importance of commercial fishing to local communities is often overlooked. Annual per capita fish and seafood consumption (from all sectors) in Sydney increased between 1991 and 1999 from 13.5 kg to 15.1 kg edible weight, an increase of 12.7%. In-home consumption was much greater at 19% (Ruello & Associates Pty Ltd, 2000).

The Lobster Fishery mainly supplies one species (eastern rock lobster) that generally has a higher per unit value than most other species taken in other commercial fisheries. The sale of eastern rock lobster supplies a high value species market niche that is quite different to that of the lower value species. A loss in supply of eastern rock lobster may be partially replaced by other species of rock lobster taken commercially in other States (e.g. southern rock lobster and western rock lobster), however a large quantity of these catches are destined for export markets and generally do not fetch the price per kg obtained by eastern rock lobster on the local market. Eastern rock lobster is not targeted in other States, therefore other commercial fisheries would not meet the market demand for eastern rock lobster, should the NSW Lobster Fishery cease.

C1.2 Employment considerations

There have been no targeted social surveys done in relation to the NSW commercial fishing industry, and there is little available information on which to estimate social impacts should the Lobster Fishery cease to operate. The economic and social survey done by Roy Morgan Research and analysed by Dominion Consulting Pty Ltd, Umwelt Consulting Pty Ltd and NSW Department of Primary Industries has provided some information however, which allows a preliminary assessment of the nature and scale of employment associated with the fishery and the economic impacts on that community should the fishery no longer exist.

In January 2004, there were 161 fishing businesses in NSW with shareholdings in the Lobster Fishery, comprising approximately 149 individual endorsed fishers. Additionally, there are a considerable number of people who assist in the operation of businesses in the Lobster Fishery (both directly and indirectly). There are also people employed in subsidiary industries such as fish processing, transport or the retail sector. The available studies relating to employment flow-on effects for commercial fisheries in NSW indicate a multiplier factor of 0.5 times the direct effect (Tamblyn and Powell, 1988; Powell *et al*., 1989).

The lobster fishing community tends to focus around key ports such as Coffs Harbour, Port Stephens, Illawarra and Batemans Bay, however, a significant number of fishers reside in communities adjacent to the coast throughout NSW. Based on the NSW Department of Primary Industries fisheries catch and effort records, of the 147 fishers who participated in the Lobster Fishery in 2001-02, 65% also operated in other NSW commercial fisheries. Whilst of the 72% of lobster fishers responding to the Roy Morgan social survey (refer to section 4 of Chapter B), 16.5% also worked in other industries (i.e. outside commercial fishing).

It is not known how fishers would change their business structure if there was no longer a commercial Lobster Fishery in NSW. It is reasonable to expect however, that lobster fishers with endorsements to fish in other fisheries would put more fishing effort into these other fisheries to compensate for any lost income. This may increase the risk of conflict between fishers as they compete for a share of the stocks and may result in the need to implement additional effort controls in those other fisheries.

It is also reasonable to expect that a number of people would have to find alternative employment, though a considerable number of fishers are at or nearing retirement age. Of the current shareholders, 39% are owner operators with ages of 50 years or over. A social survey found that 72% of lobster fishers responding to the survey believe they would be unable to gain employment outside of fishing, and 78% of these people indicated that they would not consider retraining (refer to section 5 of Chapter B).

C1.3 Economic considerations

In the 2001-02 season the Lobster Fishery was estimated to have a total revenue at point of first sale of approximately $4.74 million. This value is considerably increased if the assessment considers supply of goods and services to the fishery, and the value adding of seafood products through wholesale, retail and restaurant outlets.

The results of the economic survey, completed as part of this EIS (see Chapter B), found that 38% of businesses surveyed were earning an economic surplus and contributed to the Gross Domestic Product (GDP). All businesses contributed to the local economy through the purchase of inputs and factors of production. This revenue for the fishery provides an important source of employment for fishers and forms an important component of the total business income for the high proportion of fishing businesses that participate in other commercial fisheries (i.e. ~ 65%).

There are also economic multiplier effects that augment the value of the Lobster Fishery in regional communities. Economic multipliers in the fishing industry are, however, low and total effects are generally between 1.5 and 2 times the direct effect (Tamblyn and Powell, 1988; Powell *et al*., 1989). The economic survey done during the preparation of this EIS and other studies undertaken on the expenditure of fishers in NSW (see McVerry, 1996) have shown that 27% of expenditure from fishing businesses moves outside the region of operation. Approximately 70% of the first sale value of the catch stays within the communities where fishing takes place. This translates to approximately $3.32 million of fishing revenue generated from the Lobster Fishery that is potentially spent in the local regions that would be lost if the fishery ceased to operate.

C2 No changes to existing management arrangements

The existing management arrangements for lobster fishing in NSW waters are outlined within Part I of Chapter B. Part II of Chapter B identifies the risks associated with the current operation of the Lobster Fishery.

Should there be no change to the existing management arrangements in the fishery, these risks would remain unaddressed. As such, the fishery would risk not being able to demonstrate its ecological sustainability and may experience a reduction in economic viability in the medium to long term.

C3 Alternative harvesting methods

There are two methods by which lobster fishers may currently take eastern rock lobster in this fishery, by lobster trap and by hand picking (without using underwater breathing apparatus). Taking eastern rock lobster by hand is considered the most selective method of catch. It has minimal impact on habitat, limited bycatch (i.e. only non-retainable lobsters), and would therefore seem the most environmentally suitable method for taking lobsters. However, diving for lobsters is not as efficient as lobster trapping when trying to meet the high commercial demand for this species. Lobster divers are restricted by depth and by what they can physically hold and retrieve to a boat or shore.

Even if given the opportunity to use SCUBA or hookah gear to assist commercial diving operations, diving for lobsters in waters deeper than 30m would not be feasible. A significant quantity of harvested lobsters are trapped in waters deeper than 30 m (NSW Department of Primary Industries fish catch records, 2003), beyond the safe depths of SCUBA or hookah assisted diving. Restricting commercial lobster fishers to diving methods only would cause increased targeting and pressure on inshore populations of lobsters, and could lead to a reduction in yield per recruit if consistently smaller lobsters are harvested.

There are a number of compliance and resource sharing issues associated with permitting the use of SCUBA or hookah gear to assist lobster diving operations. Resource sharing issues may arise if recreational fishing grounds and catches were impacted by the higher levels of commercial fishing effort concentrated on inshore, and nearshore areas. It may also stimulate pressure from recreational fishing stakeholders to allow lobsters to be taken recreationally with the assistance of SCUBA and hookah gear. The use of SCUBA or hookah assisted diving for lobsters would also increase the opportunity for illegal poaching of lobsters from set traps, and the use of unmarked traps to collect lobsters. The potential increased difficulties in providing effective compliance of lobster fishing operations have contributed to NSW Department of Primary Industries (previously NSW Fisheries) and the Lobster MAC not supporting proposals to add this method to the fishery in the past.

Although the quantity of bycatch caught in lobster traps and the potential impacts of trapping on sea floor habitats are greater than those associated with the diving method, such impacts are still considered to be low, particularly when compared to other commercial fishing methods such as hauling and trawling.

Eastern rock lobsters often inhabit rocky reef sub-tidal habitat when inshore and undertake longshore migrations along the ocean floor as sub-adults. Lobsters are rarely (if ever) taken by line methods, and beach or boat based (pelagic) hauling methods are not effective in catching substantial quantities of lobsters. The only alternative method that could feasibly take eastern rock lobsters would

be trawling. Demersal trawling is a non-selective method, with significantly greater quantities of byproduct and bycatch than trap fisheries. Over 300 species of fish and 80 species of mobile invertebrates have been recorded in ocean prawn trawl and ocean fish trawl operations during observer studies and research trawls conducted in NSW waters during the 1990s (Liggins, 1996; Graham *et al.*, 1996). It would be reasonable to assume the potential impact on threatened species, populations and ecological communities from trawling operations is greater than from lobster trapping activities where comparatively minimal byproduct or bycatch has been recorded in observer surveys (Liggins *et al.,* In Prep).

Taking into account the alternative harvesting methods, lobster trapping is the only method that will be able to meet the strong consumer demand for rock lobsters efficiently and with minimal impact on bycatch, biodiversity and threatened species. Furthermore, whilst not widely practiced by commercial fishers, taking rock lobster by hand should remain an allowable method as it is highly selective and has negligible impact on habitats.

C4 Alternative performance indicators and monitoring programs

The Lobster Share Management Plan introduced formal performance monitoring into the Lobster Fishery in 2000. It causes an annual review of the performance of the fishery against six major objectives and includes one performance indicator and trigger point per objective. To monitor the fishery against all aspects of ESD and in light of the environmental risk assessment conducted for the fishery, a more comprehensive suite of performance indicators need to be developed, using the existing set in the share management plan as a basis.

The draft Fishery Management Strategy (FMS) for the Lobster Fishery presented in Chapter D contains seven broad goals, each with a number of objectives and a much larger number of individual management responses, some of which are new actions. The extensive set of responses is necessary to manage the risks identified in the environmental risk assessment of the Lobster fishery (Chapter B). With the large number of management responses and objectives, there would be considerable costs associated with monitoring the performance of the strategy against each management response, or even against each objective.

Changes in the sustainability and viability of the fishery will be affected by the continuation of existing management arrangements and the introduction of new actions under the fishery management strategy, as well as a significant range of factors external to the fishery (e.g. environmental conditions and market conditions). In addition, as full cost recovery applies to the Lobster Fishery, the more extensive and costly performance monitoring is, the greater the costs are for industry to cover. Considering that economic viability has been identified as a significant issue in the future management of this fishery, it is desirable that cost increases be kept to the lowest feasible level.

The seven goals proposed in the draft FMS address the major areas of risk identified for the fishery. Monitoring the performance of the fishery against each goal is therefore the most cost effective way of measuring performance of the strategy.

The performance indicators outlined in the draft FMS (section 5 of Chapter D) have been identified as the preferred indicators, taking into consideration both the major issues or risks associated with the Lobster Fishery and the general costs of monitoring. A number of performance indicators proposed in the strategy will act as surrogate indicators until more appropriate alternatives

can be developed. For instance, a performance indicator to measure the impact of individual fisheries on biodiversity cannot currently be specified due to the (generally world-wide) lack of knowledge regarding the dynamics of aquatic ecosystems. Similarly, it is difficult to identify a single performance indicator available to monitor trends in the commercial viability of typical fishing businesses. Alternatives to the proposed indicators would be those that produce a meaningful outcome, and could be monitored without causing significant increases in the cost of management, research or administration.

'Adaptive management' is increasingly accepted as an ideal framework for management and policy development. However, it can be an expensive process (i.e. in terms of both the experimental design and the necessary data collection and analysis) depending on how it is applied. Adaptive management can be broadly defined as "*a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs*" (Bennett and Lawrence, 2002).

In an active sense, the design and implementation of a cost effective adaptive management system should take account of the natural and anthropogenic characteristics, variables, interrelationships, scale and risks relevant to the use of a specific natural resource, as well as the way in which the monitoring results can be used to inform ongoing management decisions. The limited availability of knowledge and information for many natural systems demands that management decisions need to be refined over time as knowledge and information progressively improve (Healthy Rivers Commission, 2000). Adaptive management can be applied in a responsive way by using readily available and broad indicators to monitor performance and adjust management against set goals. Alternatively, this can be done through a robust experimental design that drives the monitoring program to determine whether the aims of each management action (i.e. response) are being/have been achieved.

It would be problematic to successfully introduce a system based on a robust experimental design for each aspect of the Lobster Fishery, where individual management actions generally assist in achieving more than one goal or objective (or address more than one hypothesis). Application of active adaptive management in the Lobster Fishery would, in most cases, require a greater number of variables to be monitored, leading to increased costs that would be borne by the shareholders. It would also be difficult to determine the cumulative effects of the multiple management responses in achieving each goal or objective.

The management regime outlined in the draft FMS for the Lobster Fishery is a 'responsive' program that enables the regime to be changed in response to new information or if the trigger points are breached over time. It incorporates the principles of adaptive management.

C5 Alternative arrangements for cost recovery or funding

C5.1 Independent Pricing and Regulatory Tribunal (IPART)

In 1998, the Independent Pricing and Regulatory Tribunal (IPART) conducted a study to determine the pricing principles that should apply to management charges in NSW commercial fisheries. IPART is an independent statutory body established to regulate the prices charged by NSW government.

In its final report, IPART recommended application of the following pricing principles:

1. Users should pay the efficient costs of management
2. Costs allocated to commercial fisheries should be clearly identified in a transparent process
3. Costs allocated to commercial fisheries should be paid for by those who create the need for, or who benefit from, management of commercial fisheries
4. Subject to its responsibility to administer the *Fisheries Management Act 1994* and implement government policy, NSW Department of Primary Industries should be accountable to those paying for management
5, To encourage services to be delivered more efficiently, the right to provide management services over a specified period should be subject to competition wherever practical.

With regard to the Lobster Fishery in particular, IPART found that costs of management (allowing for 30% efficiency improvements in overhead costs and 20% in other areas), should be shared between commercial (estimated at 90%) and recreational fishers on the basis of relative share of the legal catch (IPART, 1998). In order for commercial lobster fishers to cover the costs of management IPART recommended management charges to be levied at $90 per share.

C5.2 Current funding of management, compliance and research in the Lobster Fishery

The current NSW Government policy on cost recovery is based on the IPART principles and lobster shareholders pay management charges in proportion to their shareholding to cover the efficient and beneficial costs of management, compliance and research. Other costs incurred by commercial fishers include transaction fees for administrative and licensing tasks, such as share or quota transfer, licence renewal or boat replacement. These fees are charged upon application for the individual tasks undertaken.

Applications for research funding can be made to external bodies such as the Fisheries Research and Development Council (FRDC). Although shareholders have continued to pay a levy to FRDC, all lobster research projects undertaken following the move to full cost recovery have been funded by either industry, NSW Department of Primary Industries or by a combination of both.

Shareholders in a category 1 share management fishery are also required to make a periodic contribution to the community for their right to access the community owned resource. 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 that review.

C5.3 Alternative arrangements for cost-effective delivery of management

Following the risk assessment in Chapter B, a number of management responses and research programs have been proposed in the draft FMS (see Chapter D) to address major issues and reduce the significant risks that have been identified in the assessment. Many of these are actions or programs that are already underway, or are new responses that will require little, if any, additional resources to

implement. Some, however, may require additional resources to implement and alternative cost recovery arrangements and/or sources of funding need to be considered.

There are three broad alternatives to fund the existing management programs or the management responses and/or research programs proposed in the draft FMS:

1. *All costs subsidised by government* - One option is for government to fund the complete costs of management, compliance and research attributable to the Lobster Fishery. However, cost recovery is a common policy for Australian commercial fisheries and an important principle of ecologically sustainable development. The concept of users pays (or 'beneficiary pays' as per the IPART findings) aims to internalise the environmental costs by the proponents whose activities have detrimental impacts on natural resources. To have full government funding would be contrary to contemporary competition policy and natural resource management principles and is not recommended.

2. *All costs funded by lobster shareholders* – This option would see lobster shareholders paying for the full cost of management, compliance and research associated with the fishery, even those services that benefit other fishing sectors or fisheries in other jurisdictions. For the reasons outlined in the report prepared by IPART (see IPART, 1998), this option would be inequitable for lobster shareholders and is not recommended.

3. *Funding from external sources (i.e. other than industry or Government)* – This option entails relying on externally sourced funds to pay for all management, compliance and research costs attributable to the Lobster Fishery. While an ideal prospect, there can be no guarantee that such funding would be forthcoming and indeed most externally funded projects are discreet projects that have a flow of benefits to other user groups or jurisdictions. For these reasons, this option is not feasible or recommended.

Given that the options described above are not feasible, the best approach to cost recovery is to continue with the fair and transparent cost recovery policy currently in place for the Lobster Fishery. Applications will continue to be made to FRDC or other funding providers for any for any research projects identified as eligible for external funding.

In terms of who undertakes the delivery of services for commercial fisheries, a number of alternatives to the current practice are possible. They range from all services provided by the government to all services being outsourced and managed by the industry, with a number of possible combinations for service provision in between.

A detailed independent study investigating the potential alternative service delivery arrangements for the future management of commercial fisheries in NSW has recently been finalised. The study, conducted by Marsden Jacob Associates, identifies the potential for models that provide for a higher level of involvement by the commercial industry in fisheries management, whilst enabling government to fulfil its responsibilities for ensuring the long-term sustainability of commercial fisheries and providing equitable sharing of a community-owned resource. The feasibility of this approach to service delivery, including industry's ability to fund such a model, is currently being investigated. Whatever the outcome of this process, the draft FMS should be sufficiently broad and adaptive such that it can be implemented using any service delivery model.