ABALONE FISHERY

Environmental Impact Statement

AN OVERVIEW

NSW DEPARTMENT OF PRIMARY INDUSTRIES

The Ecology Lab Pty Ltd

Marine and Freshwater Studies

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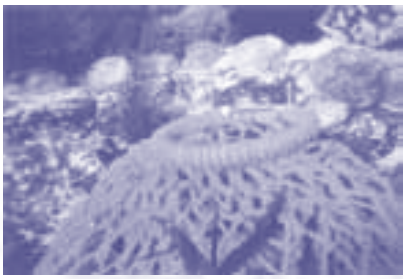

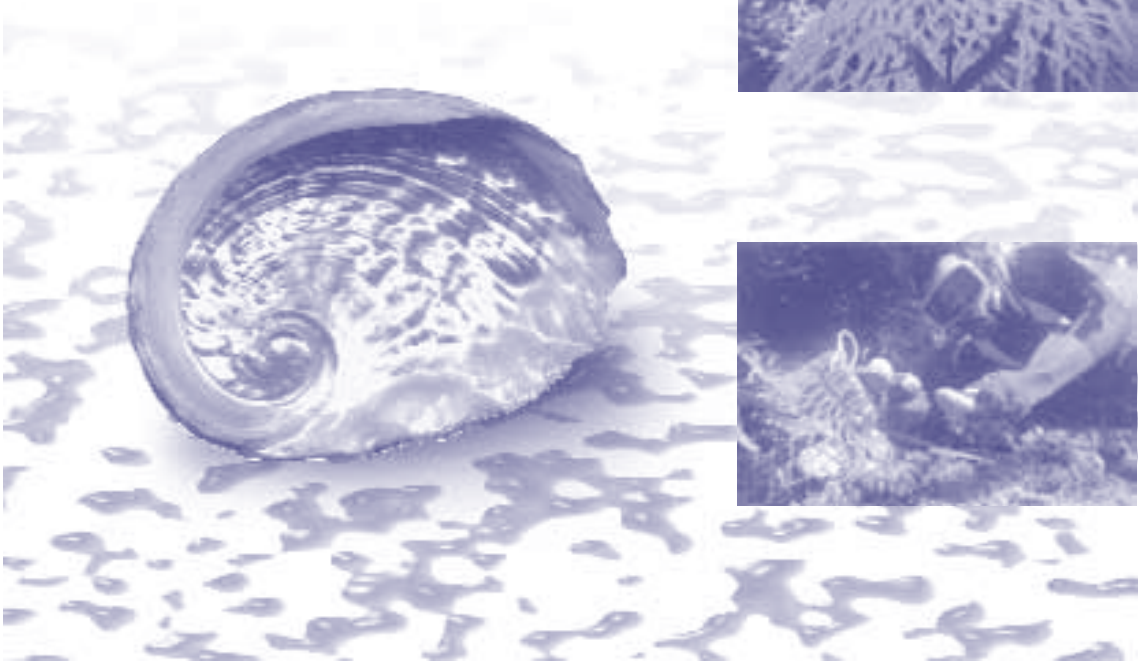

INTRODUCTION

The Abalone Fishery is a quota managed fishery which targets the blacklip abalone (*Haliotis rubra*) along coastal reefs of NSW. It is a highly specialised fishery which provides a valuable seafood product, most of which is exported. The fishery is intensively managed with a history of pro-active administrative, research and compliance programs. Moreover, participants in the fishery have been closely involved in the development of many of the management arrangements.

The operation of the current activity causes some environmental, social or economic risks. The recent effects of some external factors have combined to exacerbate some risks. In particular, there is risk to the economic viability of operators in the fishery. These risks must be addressed for the activity to proceed sustainably and for the necessary approvals to be granted. A number of actions have been proposed to address the risks, including the framework for a more efficient harvesting strategy measures to minimise the impact of external factors affecting the fishery and measures that allow the capacity of the commercial fishery and individual fishing businesses to adjust according to economic conditions. The actions proposed represent a balanced approach to securing the objectives sought for commercial abalone fishing and sustainable fisheries.

The Environmental Impact Statement (EIS) for the Abalone Fishery presents a thorough, frank and transparent assessment of the risks associated with the current activity and the measures proposed to address the risks.

This summary provides an introduction to the environmental assessment process. It briefly outlines the context within which the fishery currently operates, the management arrangements proposed for the fishery (i.e. the draft fishery management strategy), and the findings of the environmental impact assessment.

Public exhibition of the EIS provides an opportunity for the community to review the environmental performance of the activity of commercial abalone fishing and to have input into its future management.

The Development of Fishery Management Strategies and Environmental Impact Statements

In December 2000, the NSW Government made changes to ensure that fishing activities in NSW are managed in an ecologically sustainable way. The changes require the development and implementation of fisheries management strategies and associated environmental assessments for each major fishing activity, including the Abalone Fishery. The draft fishery management strategy (FMS) and environmental impact assessment for each fishing activity are combined within an EIS. Their structures are based on guidelines issued by the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR).

This EIS was developed using a modified framework of the generic risk management process (AS/NZS 4360) acknowledged by Standards Australia and Standards New Zealand. AS/NZS 4360 uses a seven-step process for risk management, but this EIS has added an eighth step in that following the treatment of risk (i.e. the draft FMS), it has re-evaluated the level of risk that would eventuate if the management strategy were to be implemented.

As well as satisfying the environmental assessment requirements of the *NSW*

Environmental Planning and Assessment Act 1979, the EIS is also being submitted to the Commonwealth Government to meet the assessment requirements for the *Environment Protection and Biodiversity Conservation Act 1999*.

Development of the Draft Fishery Management Strategy

Proposed management arrangements in the draft FMS were developed in a consultative process between shareholders in the commercial fishery for abalone and the NSW Department of Primary Industries (DPI), wherein industry representatives were assigned the lead role for the project. Consultation was facilitated through the Joint Abalone Working Group (JAWG), which comprised two representatives from Industry (one nominated by ABMAC and the other by the Abalone Development Company) and representatives from DPI. Input was also sought from the Abalone Management Advisory Committee (ABMAC), shareholders in the fishery directly (through a specifically designed summary paper and industry open day), the Ministerial Advisory Council's on the Seafood Industry (which includes representatives from other NSW commercial fisheries) and Recreational Fishing, the Total Allowable Catch Setting and Review Committee, the NSW Nature Conservation Council, the cross sector and expert based FMS Working Group and the Indigenous Fisheries Working Group.

The draft FMS contains the proposed rules for management of the Commercial Abalone Fishery. It also contains the objectives for the fishery, a detailed description of the way the fishery operates, and describes the long term management framework for the fishery. It outlines a program for monitoring the environmental, social and economic performance of the fishery, establishes trigger points for the review of the strategy, and requires regular reporting on performance in order to ensure that the strategy meets its objectives.

Development of the Draft Environmental Impact Assessment

The environmental impact assessment and the strategy have been developed in stages. The draft strategy assessed here is in fact the second draft of the strategy. The process has been designed to give feedback to shareholders and allow a response to the predicted environmental impacts of the management proposals. Each draft of the strategy is then modified to ensure that the proposed management framework appropriately addresses the environmental risks identified during the assessment process. Where appropriate, the assessment for the Abalone Fishery has also considered previous assessments for other fisheries in NSW, and abalone fisheries in other states, to take advantage of common approaches to impact assessment to assist in identifying issues.

It is important to recognise that, in assessing the impacts of an existing fishing industry, the activity being assessed (i.e. the Abalone Fishery) already exists. Consequently, changes to fishing practices and levels of harvest will have direct social and economic impacts on already-established fishing and related industries. It is important that when the potential impacts of proposed changes are assessed time is allowed, where appropriate, for Industry and its stakeholders to adjust to such changes.

The assessment of fishery impacts also

recognises that there is much that is unknown about aquatic ecosystems. The environmental assessment acknowledges such uncertainty and, where there is little information upon which to draw definitive conclusions, the precautionary principle is applied. The precautionary principle, a key component of the principles of ecologically sustainable development, states that 'if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent that environmental degradation'.

The EIS for The Abalone Fishery is structured as follows. The first chapter (Chapter A) presents a summary of the EIS. Chapter B reviews the existing operation of the activity, identifying where it occurs, the methods used, species taken, current management arrangements and the socio-economics related to the activity. The risks associated with all aspects of the activity are assessed to identify those aspects that require modification by the FMS. Together these chapters (Chapters A and B) comprise Volume 1 of the EIS.

Chapter C provides an outline of the main alternative management options to those of the existing activity. Chapter D describes the proposed management arrangements for the activity (i.e. the draft fishery management strategy). Chapter E assesses the potential impacts of implementing the draft FMS, that is, the extent to which the draft FMS mitigates the risks identified in Chapter B. Chapter F provides a justification for the preferred strategy, taking into account its implications in terms of ecological, social and economic factors. Together these chapters (Chapters C, D, E and F) comprise Volume 2 of the EIS.

This EIS acknowledges that the NSW commercial Abalone Fishery is currently experiencing considerable pressures due to a prolonged episode of a declining abalone stock and relatively low markets prices, as well as persistent and major external factors that are adversely affecting the fishery (e.g. abalone theft and *Perkinsus*). The assessment also recognises the historical strengths of the fishery. The draft FMS, as presented in the EIS, outlines a number of strategies that are currently in place and ways to build on these to enable the fishery to return to a viable base. The achievements of this outcome will necessitate a stronger and more cooperative partnership within the whole NSW Abalone Fishery, government agencies and the broader community.

The Existing Activity of Commercial Abalone Fishing

Commercial fishing for abalone in NSW began in the late 1950s and the Abalone Fishery is now one of the State's most valuable fisheries. Most of the product is exported to Asia. The Abalone Fishery in NSW is based upon the harvest of only one species, the blacklip abalone, *Haliotis rubra*. Abalone are taken by hand by divers using underwater breathing apparatus mostly from shallow, fringing reefs on the south coast of NSW, although some diving occurs on the mid-north coast and in deeper waters. There is virtually no overlap with other commercial fisheries in NSW as there is no use of bait, no byproduct from the fishery, virtually no bycatch and no other commercial fisheries in NSW are allowed to land abalone. Blacklip abalone are also harvested in Victoria, Tasmania, South Australia and Western Australia, where catches are generally much larger.

The Abalone Fishery is a category 1 share managed fishery and operates under the Abalone Share Management Plan 2000. Fishing rights in the commercial fishery are gained through the ownership of shares. There are a total of 3,654 shares in the fishery and there are 48 shareholders as of February 2005. As category 1 share managed fisheries are subject to a policy of cost recovery for the management of the fishery attributable to the commercial fishery, shareholders pay the majority of costs associated with administration, research and compliance as well as a 'community contribution' for privileged access to the resource. Shareholders may take abalone themselves if they hold 70 shares in the fishery or may nominate a person to take abalone on their behalf. Shareholders who hold less than 70 shares can transfer their quota to other shareholders with 70 shares or more so that their quota can be fished. As at February 2005 there were 42 people (i.e. divers) endorsed to take abalone in the commercial fishery. Divers travel to reefs to collect abalone using small boats between 5-6 m in length and usually have a deck-hand to assist them. They work during daylight hours when the sea conditions are relatively calm. The fishery operates mostly south of Sydney. Abalone divers harvest a portion of a state-wide Total Allowable Commercial Catch (TACC) as allocated to shareholders in proportion to their shareholding. There are currently no seasonal closures to the fishery and divers generally spread their fishing effort across the whole year, but subject to sea conditions. Some areas of coastline are closed to divers where populations of abalone are known to have been severely depleted due to the *Perkinsus* parasite, or where marine protected areas occur and harvesting restrictions apply.

The Abalone Fishery is one of only three fisheries under the jurisdiction of NSW where a TACC applies (the others being the Lobster Fishery and the Sea Urchin and Turban Shell Fishery). The TACC for the Abalone Fishery is determined each year by the independent TAC Committee. The TACC was set at 206 tonnes for the 2004/5 fishing period and, more recently, at 130 tonnes for the 2005/6 fishing period. An analysis of the recent change has not been included in the EIS. In addition to the catch quota, a minimum legal size (MLS) applies to collection of abalone. The MLS has been set at 115mm since 1987. At this size, the vast majority of abalone in NSW are mature, and have had the opportunity to spawn at least twice. Thus, within the Abalone Fishery, juvenile abalone cannot be collected and, if they are inadvertently collected, they must be returned to their reef habitat immediately.

Risk, Response and Predicted Outcome

The following section briefly describes the risks of the Abalone Fishery as they pertain to environmental, economic and social components (initial risk), the management responses proposed in the draft FMS to mitigate those risks (response) and a predictive assessment of the degree to which those measures may mitigate the risks (predicted outcome).

In order to address any perceived risks with existing operations, it is first necessary to describe and evaluate the potential risks arising from the manner in which operations are conducted. It is also necessary to attempt to isolate those elements of the operation that contribute most to those risks and to

adjust those elements through the draft management strategy.

To address the risks, the draft management strategy offers eight major long-term goals for the management of the fishery, which are supported by approximately 16 objectives and 60 management responses. It is important to note that a single management response can mitigate a variety of risks and therefore it is not necessary to formulate separate responses for each risk.

Biophysical Impacts

Chapter B of the EIS presents a critical evaluation of the available information on the biophysical impacts of harvesting abalone and the underlying mechanisms by which impacts may occur. An understanding of these mechanisms is important for the evaluation of future impacts of abalone fishing, and for evaluating the extent and magnitude of existing impacts.

Broadly, the operation comprises six activities that have the potential for a variety of environmental, economic and social impacts. These activities include:

- Harvesting – the removal of abalone and bycatch from reefs and disturbance of other reef biota;
- Discarding – the returning of under-sized abalone and unwanted bycatch to the sea;
- Boat movements – travel to and from reefs and while diver is harvesting;
- Boat and compressor maintenance and emissions – tasks involving fuel, oil, noise or other boat or compressor engine related activities that could result in spillages or leakages into the air or the sea;
- Loss of fishing gear – loss of catch bags or other diving equipment during harvesting or travel; and
- Marketing – the sale of abalone to processors.

These activities can, potentially, have both direct and indirect impacts on the biophysical environment. For the existing Abalone Fishery, almost all activities are considered to pose only a negligible or low risk to most components of the biophysical environment. Only the activities of harvesting and discarding have the potential to cause a level of risk to components of the environment that require specific management and this was limited to only some sub-components of the target species, and, potentially, to some sub-components of bycatch. This is due to the current state-wide minimum legal size (MLS), along with quota management, which has been the basis for successful management of commercial harvesting of abalone and protection of the majority of individuals on reefs. Although it is not clear how common individuals above 115 mm were in the virgin stock before it was fished down, in most areas individuals above the MLS currently represent only a small proportion of both the total population (~5%) and the mature stock(~33%) (Worthington et al. 2001). Importantly, under the current operation of the fishery, the MLS effectively protects at least 95% of the population from commercial harvesting, allows the majority of abalone in populations at least two years of spawning before being harvested and, combined with the TACC, prevents over-fishing of mature stock by the commercial fishery.

The appraisal of the management responses in the draft FMS has been made on the basis that proposed research and monitoring will

be undertaken. Research and monitoring should remove uncertainty surrounding the activity and predictions made in the EIS. It should also allow a retrospective analysis of the accuracy of the assessment and facilitate the implementation of new management measures if necessary.

The Target Species

Initial Risk

Broadly, the risk assessed is the likelihood of populations of blacklip abalone, *Haliotis rubra*, being affected adversely by the operation of the fishery. The assessment determined that the current activity of harvesting abalone above the MLS had potential for a high risk to the abundance of mature stock at local geographical scales and a moderate risk at general scales. There was also a moderate risk to the distribution of abalone at all scales and the size-structure and non-retained (discarded) abalone at local scales.

Issues Arising

The effects of external factors would tend to exacerbate the risk from the commercial fishery. Illegal catch of abalone by unlicensed operators is thought to be great. Illegal operators tend to take abalone much smaller than the MLS and can devastate local populations. The cumulative potential impact of illegal fishing is considered to create a much greater risk than the initial risk from legal commercial harvesting abalone.

There has been large-scale depletion of abalone in recent times between Port Stephens and Jervis Bay due to infection from the parasite *Perkinsus*, although small pockets of abalone within this area remain unaffected. This has effectively restricted the commercial fishery in NSW to areas south of Jervis Bay.

Recently, catch rates in general have declined, a number if new inexperienced divers have entered the industry, and experienced and inexperienced divers may have found it necessary to concentrate their fishing effort in specific areas. Under these circumstances discarding may have increased as a result of dislodging, measuring and returning some abalone more frequently on some reefs. As a proportion of discarded abalone may die, increased rates of discarding are a potential threat to non-retained abalone.

Limited dispersal of abalone larvae away from their parents means that there is slow recovery of depleted populations at local scales. The combined effects of illegal fishing, a geographical shift in fishing effort due to the effects of *Perkinsus* and the potential for increased discarding potentially increase the risk to remaining harvested populations of abalone.

Response

The draft FMS proposes a number of responses that address risks to the target species. The extent to which the overall risks are reduced will depend on the effectiveness of existing and new management controls and successful implementation. The major programs in the draft FMS for addressing risks include the following:

Management:

- Continue to apply the TACC, state-wide MLS, and improve compliance strategy and stock assessment program;
- Development of a more complete harvest strategy, including rebuilding stock - the intent is to develop a

set of guidelines based on sustainability that also allow managers of the fishery to achieve specific goals and industry to plan operations more effectively over the medium- and longer-term. Guidelines for the harvest strategy would combine the use of the TACC with other measures proposed to make harvesting more efficient and to rebuild populations where appropriate. Strategies are proposed for re-establishing populations of abalone in areas where abalone were once commercially viable but have now been depleted (e.g. from *Perkinsus*, illegal fishing). Strategies include: closures for protecting some populations as required; and rebuilding through reseeding, translocating abalone (i.e. moving brood-stock over small distances) and restoring populations of abalone through harvesting of sea urchins. There is also intent to investigate the possibility of using different size-limits for different areas and for controlled fish-downs of stunted populations and for developing a harvesting plan for Region 1(i.e. in and around areas where abalone are infected by *Perkinsus*);

- Catch and effort – alternatives are proposed for how catch and effort are managed to avoid inappropriate concentrations that may result in over-fishing. The final detail of the management response will be determined after options presented in the EIS have been thoroughly considered (Chapter C);
- Minimise the rate of disturbance to abalone under the MLS – development of a method for monitoring the rate of discarding is proposed and there is intent in the code of practice to control the potential for unsustainable harvesting practices (particularly relating to the discarding issue); and
- Minimising external impacts – new strategies are proposed to address illegal fishing. These include: the application of stronger safeguards in the processing sector; investigating the cost and benefits of strategies already used by Compliance; and an industry-based reporting program to assist Compliance in identifying where illegal activity may be occurring. It is important to note that the Compliance strategies in the FMS will be responsive to government decisions to the *Report on Illegal Fishing for Commercial Gain or Profit in NSW* (Palmer 2004). A strategy is proposed for developing a plan for harvesting in the area affected by *Perkinsus*. Finally, there is intent to seek better communication between the commercial sector

and proponents of proposals for development that may adversely affect abalone.

Research:

- Develop ways to mitigate the effects of *Perkinsus*, including a strategy for harvesting in and around areas where abalone are infected;
- Objectively assess the benefits of appropriate alternative size limits for particular areas;
- Objectively assess the benefits of appropriate regional or local catch controls for particular areas;
- Continue to assess the benefits of reseeding, translocating and restoring populations of abalone;
- Finalise a method for estimating the level of discarding in the fishery to be used as a basis for developing a program for minimising potential impacts to non-retained abalone; and
- Continue to investigate methods for estimating the illegal, recreational and Indigenous catches of abalone.

Monitoring:

- Continued monitoring of the general population of abalone and the commercial fishery to assess the status of exploitation; and
- Continued monitoring of populations of abalone in and around areas affected by *Perkinsus*.

Predicted Outcome

These management measures are likely to result in reduced risk to the abundance of mature stock, non-retained abalone and the distribution and size-structure of populations of abalone and therefore enhance the sustainability of the fishery. For many of the management controls, specific mechanisms to be used would be developed during the implementation of the strategy. Therefore, it is most important that the implementation arrangements, including research and monitoring, will be appropriate to address the goals and objectives stated in the strategy.

Bycatch

Initial Risk

The risk assessed is the likelihood of species of bycatch being affected adversely by the operation of the fishery. The assessment determined that the activities of harvesting abalone above the MLS and discarding bycatch have the potential for a low to moderate risk to species of bycatch. Despite bycatch being confined to small organisms attached to the shell of abalone or living in the foot or mantle cavity, substantial knowledge gaps about the identity and ecology of bycatch leaves some uncertainty surrounding the risks of operations. As most abalone removed from the reef are above the MLS (abalone below the MLS are measured and generally returned immediately to the reef) the risk under current operations was considered low to species of bycatch with general habitat requirements but moderate at local scales for species of bycatch with potentially specific requirements for living in association with abalone.

Issues Arising

Knowledge about the identity and ecology of bycatch species needs to be improved, particularly whether there are any species with specific requirements for living upon abalone and the potential effects the removal of abalone above the MLS would have on these species. As few data exist about species of bycatch it is difficult to quantify the extent to which impacts would be reduced under the draft FMS. It is reasonable, however, to predict that if populations of abalone are maintained, many species associated with abalone would also be maintained.

Response

The measures proposed in the draft FMS to mitigate risk to species of bycatch are focussed on obtaining better information about bycatch and the effects on these species of removing abalone above the MLS. In addition, it is proposed that the information gathered is used for developing 'best practice' diver behaviour in regard to minimising the potential for adverse impacts. The major programs in the draft FMS that address the risk to species of bycatch can be divided into the following:

Management:

- Continued implementation and development of a program to monitor the effects of harvesting abalone above the MLS on the biophysical environment and increase knowledge where appropriate; and
- Promote, through the fishery code of practice, fishing practices that minimise the potential for adverse impacts upon bycatch species.

Research:

- Continued development of a program to increase knowledge of the effects of harvesting abalone above the MLS on the biophysical environment (biota, populations, ecological communities and ecosystem processes).

Monitoring:

- Continued implementation of a program to monitor the effects of harvesting abalone above the MLS on the biophysical environment.

Predicted Outcome

There are still many aspects of bycatch that remain uncertain, particularly whether there are any species of bycatch that have specific requirements for living on abalone. In the absence of scientifically rigorous data, this assessment has taken a highly precautionary approach. Hence, there is no change to the initial risks under the draft FMS.

Given the low to moderate level of risk to bycatch, the measures contained in the draft FMS are appropriate provided that the information obtained from research about bycatch is fed back into other management responses (such as for improvements to the fishery code of practice) and used to reduce the potential for impacts.

Threatened and Protected Species

Initial Risk

The risk assessed is the probability that any aspect of the fishery would impede the conservation and recovery of a threatened

species. The assessment determined that threatened and protected species were at low risk, and only from the activities of harvesting and boat movements. There are also specific regulations that apply to interactions with threatened species and these would be re-iterated as part of the code of practice for the fishery. The low risk considered to threatened and protected species is due to the apparently low rate of interaction between the commercial fishery and these species.

Issues Arising

On-going monitoring of the interaction between the fishery and threatened and protected species is required to ensure that the level of impact on these species does not increase in the future. Such monitoring should involve a mechanism for recording and reporting details of interactions with threatened species where appropriate (e.g. when boat strikes occur, when new aggregations of threatened species are located within abalone grounds, etc.).

The draft FMS includes a mechanism (i.e. the code of practice) to respond to future listings of species under the threatened species legislation. Such a mechanism is necessary to ensure any species that the fishery interacts with is protected in a timely manner. At this stage, compliance with the code of practice will be on a voluntary basis only.

Response

The measures proposed to mitigate risk to threatened and protected species are focussed on obtaining better information on interactions between abalone divers and threatened species in the fishery and providing the means for 'best practice' diver behaviour in regard to minimising the potential for adverse impacts. The major programs in the draft FMS for addressing the risk to threatened and protected species can be divided into the following:

Management:

- Continued implementation and development of a program to increase knowledge of the effects of harvesting abalone above the MLS on the environment;
- Implement actions required in accordance with recovery plans for threatened species or threat abatement plans – adherence to the provisions in such plans will promote the recovery of these species;
- Promote, through the code of practice, fishing practices that minimise negative interactions with protected fish and threatened species; and
- Ensure, through the code of practice, that Industry is aware of increasing knowledge of the distribution, occurrence and requirements of threatened species that may be encountered during the operation of the fishery.

Research:

- Continued development of a program to increase knowledge of the effects of harvesting abalone above the MLS on the environment.

Monitoring:

- Implement a program, through the fishery code of practice,


whereby abalone divers record details of interactions with threatened and protected species– to determine when there are any adverse impacts and to improve knowledge about the locations of known and new occurrences of individuals or groups. The extent to which interactions were reported would be verified, wherever feasible, by the scientific research program.

Predicted Outcome

In general, risks to threatened and protected species from abalone harvesting operations under the present management arrangements are low and there is no direct change to these risks predicted under the draft FMS. Given the low level of risk the measures contained in the draft FMS are appropriate provided that the information obtained is fed back into other management responses, such as amendments to the code of practice.

Other Species, Assemblages and Habitats

Initial Risk

The risk assessed for other species, assemblages and habitat is the likelihood that these components of the aquatic environment will be degraded by the current activities of the fishery. The assessment determined that the activity of harvesting has the potential to affect other species, assemblages and habitats but the risk of adverse impacts was generally low. The risk was considered low due to the apparently low rate of interaction between the fishery and other species, assemblages and habitats. As abalone divers are highly selective in what they take and there is minimal anchor damage and other physical disturbance to other species or habitats, the only risk comes from the ecological consequences of removing abalone above the MLS.

Issues Arising

Despite the generally low risk from abalone harvesting activities it is apparent that knowledge about the ecological interactions between abalone and other species and habitats could be improved with respect to the effects of the removal of abalone above the MLS. As there is little factual information available it is difficult to quantify the extent to which impacts would be reduced under the draft FMS, hence a precautionary approach was used. Monitoring of the effects of harvesting abalone above the MLS should be continued to ensure there are no adverse impacts and research should be undertaken where gaps in knowledge are identified.

Some measures proposed for rebuilding and reducing risk to the target species (i.e. reseeding, moving brood-stock and rehabilitating habitat through sea urchin harvesting) have some potential to affect other species, assemblages and habitats if not managed appropriately.

Response

The measures proposed in the draft FMS to mitigate risk to other species, assemblages and habitat are focussed on obtaining better information on the effects of removing abalone above the MLS and towards providing the means for 'best practice' diver behaviour in regard to minimising the potential for adverse impacts.

The major programs in the draft FMS to address the risk to other species, assemblages

and habitats can be divided into the following:

Management:

- Continued implementation and development of a program to monitor the effects of harvesting abalone above the MLS on the environment and to increase knowledge where appropriate;
- Promote, through the code of practice, fishing practices that minimise the potential for adverse impacts upon the environment; and
- Restrict management responses aimed at enhancing populations of abalone (i.e. reseeding, moving brood-stock and habitat rehabilitation) so that they minimise risk to other species, assemblages and habitats. Programs would be experimental only and restricted to < 1% of reef in water depths of < 20 m and require approval with regard to the *FM Act* and the *Environment Planning & Assessment Act* (this would require an Environmental Impact Statement to be prepared with regard to stocking and an appropriate assessment for translocation and harvesting sea urchins).

Research:

- Continued development of a program to increase knowledge of the effects of harvesting abalone above the MLS on the environment.

Monitoring:

- Continued implementation of a program to monitor the effects of harvesting abalone above the MLS on the environment.

Predicted Outcome

In general, risks to other species, assemblages and habitat from abalone harvesting operations under the present management arrangements are considered low and proposals under the draft FMS would not change these risks. Given the low level of risk from harvesting, the measures contained in the draft FMS are appropriate provided that the information obtained from research and monitoring projects is fed back into other management responses, such as amendments to the code of practice or refinement of the experimental programs and used to reduce the potential for impacts.

Economic Issues

Initial Risk

The risk being assessed can be broadly defined as the likelihood that the current activities of the Abalone Fishery will have an adverse impact on the economic viability of the Abalone Fishery. It is important to note that there is limited validated data available to accurately assess the economic condition of the Abalone Fishery, and the observations drawn in the EIS assessment should be viewed cautiously. Further, the TACC (and revenue), has declined since the observations were made.

The NSW Abalone Fishery is one of the State's most valuable and regionally important fisheries. In 2002, the estimated annual total revenue of the NSW Abalone Fishery was about $12.5m, being approximately 15% of the total annual fishery

production in NSW. Capital investment in abalone fishing equipment amounted to $4m, with a further $1.3m invested in the abalone-processing sector. In 2003, about 87 persons were directly employed in the catching sector of the fishery (17 shareholder-divers, 33 nominated divers, 37 deckhands) and about 106 persons in the processing sector.

The market mechanism is central to the share management system, whereby changes in profitability of fishing effort are reflected in changes in share values. The major determinants of short-term profitability are the TACC and beach prices. These are dependent on a range of internal and external factors (stock health, management charges, trade policies, exchange rates and foreign demand). It is estimated that, in 2001-02, the performance of shareholders using nominated divers slightly exceeded that of shareholder-divers, with returns to full equity of 5.1% and 4.4%, respectively. In the same period, the nominated divers had a 7.9% return to full equity. The fishery's economic performance has declined since 2001 due to quota reductions and relatively low beach prices. In 2003-04, the performance of shareholders using nominated divers slightly exceeded that of shareholder-divers, with estimated returns to full equity of shareholders using nominated divers, shareholder-divers and nominated divers of –0.3%, 1.3% and -27.3%, respectively. The long-term viability of the operators in the fishery is therefore at risk.

Issues Arising

The fishery is significantly affected by variations in the abundance of harvestable abalone, as reflected in the TACC, and beach prices for abalone, particularly when low TACCs and prices coincide or prevail for prolonged episodes. The fishery currently is economically under performing and there are risks to economic viability for the fishery and individual businesses (depending on their structure). The recent increase in the number of divers from 37 to 42 and the potential for a further increase to 52 (and associated labour and capital costs) has the potential to erode the economic productivity of the fishery.

There is an apparent lack of Industry preparedness to plan for and adjust to variations in the abundance of harvestable abalone (as reflected in the TACC) or changes in the abalone beach prices, particularly if low TACCs or low beach prices prevail for extended periods. Potential barriers exist both within the industry and the current management arrangements that could limit the industry's ability to adjust their businesses appropriately. With respect to management arrangements, the current rules requiring a minimum trade of 10 shares and limiting the maximum shareholding to 6% are likely to impede flexibility.

Under current arrangements, the economic viability of the fishery is assessed by monitoring the value and transactions of shares. This has proven to inadequately reflect the economic performance of the fishery in some years.

Response

It is the NSW Government's intention to promote a viable commercial abalone fishing industry, consistent with ecological sustainability and to ensure cost-effective and efficient management and compliance. This intent was reflected in the initial establishment of a secure property right under the share management provisions of the *FM* Act, and more recently the decision to revise the methodology for setting the

community contribution.

The draft FMS shows a clear intent to continue the key elements of the current management arrangements and to explore new initiatives to improve the viability of the fishery. The major programs in the draft FMS for addressing the risks to the economic viability of the fishery are:

Management:

- The draft FMS proposes a number of measures that aim to reduce the risk of decline to the TACC and for rebuilding stocks including management responses that aim to reduce illegal catch, manage the effects of *Perkinsus*, experimental work to progress the potential for reseeding and translocating abalone, rehabilitating habitat, as well as exploring alternative size limits;
- The draft FMS signals the intent to develop and implement a structured and orderly approach for structural adjustment in the fishery, through capping or potentially reducing the number of divers (and associated labour and capital costs). The effectiveness of this response will be dependent on the detailed arrangements of any such approach, which are yet to be determined;
- The draft FMS includes responses to support the viability of the fishery by providing greater flexibility for shareholders to adjust to the variable TACC and beach prices. These responses include reducing the minimum number of shares that can be traded from 10 to one share, and removing the 6 percent cap on maximum shareholdings;
- The response to examine ways to improve industry's preparedness for significant variations in the TACC or beach price may also lead to the development of more flexible tools, such as changes in the TACC setting process to dampen the impact of the variability of abalone stocks or the concept of a sinking fund that could be drawn on during periods of low TACC/prices; and
- The cost-effectiveness of fisheries management services and management service delivery mechanisms is to be critically evaluated under the draft FMS through a review mechanism and service agreements with departmental or private service providers.

Research:

- The continuation of the independent TACC setting process and stock assessment approach; and
- Research into the effects of *Perkinsus*.

Monitoring:

- It is proposed to monitor beach price, commercial catch, catch rate and management fees as key indicators of the economic viability of the fishery.

Predicted Outcome

There are some factors beyond the control of this management strategy, such as market forces affecting the beach price of abalone and the investment and operational decisions made by individual shareholders.

The development of a comprehensive structural adjustment approach to improve long term productivity is required for this fishery, although some of the details are yet to be determined (particularly with regard to the number of divers and associated labour and capital costs). The proposed actions to provide Industry greater flexibility to adjust to environmental and economic fluctuations by adjusting shareholdings should also assist adjustment. The other proposals foreshadowed in the draft FMS regarding the potential refinement of the TACC setting approach and the exploration of financial strategies to mitigate some of the variation in the abundance of harvestable abalone (as reflected in the TACC) and beach prices are considered warranted. Additionally, the proposed actions for experimental work on reseeding and translocating abalone are viewed as positive initiatives to rebuild abalone stocks.

The performance reporting and regime for monitoring the economic viability of the fishery described in the draft FMS are considered to be adequate in terms of the information requirements and the suitability of performance indicators and trigger points. The new measures are likely to reflect the economic viability of the fishery more directly than the existing indicators related to shares. Hence there is a greater probability of identifying economic problems more rapidly, so that remedial action can be taken.

The commitment to develop and implement service agreements is viewed as a positive step towards better definition of the relationship between Industry and the service providers, as well as more transparent costing and reporting. Equally, the provision for reviews of the costs of services is appropriate.

Social Impacts

Initial Risk and Issues Arising

In the context of the social environment, the risks being assessed can be broadly defined as the likelihood that the current activities of the Abalone Fishery will have negative impact on social values in the community.

A social profile of shareholders, divers and deckhands in the Abalone Fishery revealed that most are male, live around key south coast towns and have substantial experience in the industry. Approximately 42% of respondents considered fishing as a lifestyle, rather than merely a business and, as such, about 25% of respondents would not consider re-training.

There were 117 persons directly employed in the catching side of the industry and 106 directly employed in the processing sector. There are approximately 111 jobs indirectly depending on the Abalone Fishery. The total number of jobs attributable to the fishery would be 376.

The main source of income for shareholders and divers is from the Abalone Fishery (79% of total household income) with the average net taxable annual income in 2001-2 being $80,750. Half of abalone shareholders and divers have financial dependents.

Social issues arising from the current operations of the fishery are:

- Prohibitive costs to nominated

divers becoming shareholders. The lack of opportunity for nominated divers to obtain shares in the fishery has potential to lead to some nominated divers to use unsustainable fishing practices;

- Continued illegal activities, which potentially decrease the value of the community's resource, economic viability and employment opportunity and cause conflict within the community; and
- The potential for reduced employment and limited alternative employment. This comes from the potential for rationalisation of the number of fishing businesses during times when economic conditions in the fishery are hard, such as the present, and from potential loss of fishing grounds through the creation of more marine protected areas or from closures.

Response

In addition to those measures already described for protecting revenue in the fishery by maintaining or increasing the biomass of the target species the draft FMS proposes a number of measures for directly addressing the above issues. The major programs in the draft FMS for addressing the risks to social values in the community can be divided into the following:

- Continued assessment, monitoring, and regulation and policing of the commercial Abalone Fishery, and illegal fishers, are key strategies for addressing the threat of illegal harvesting to the commercial fishery and the community's resource; and
- Changed arrangements for structural adjustment to the capacity of the fishery, including limiting the number of divers and removing the maximum limit of share aggregation and allowing smaller packages of shares to be traded (although the means to do this is yet to be determined).

Predicted Outcome

There may be some reduction in illegal activity as compliance issues are comparatively well addressed in the draft strategy, with new programs to be designed for making compliance operations more efficient and new regulations for processors. Reduced illegal activity would protect or increase the economic viability of the commercial fishery thereby protecting social values in the community.

Changes to arrangements for structural adjustment to the capacity of the fishery may displace some shareholders, divers and deckhands on occasion, as the fishery adjusts to economic conditions such as seen in the past couple of years. Greater flexibility for self adjustment provides the basis for a viable commercial fishery, with more opportunities for investment, jobs and value adding and minimises the disruption from structural adjustment.

Indigenous Issues

Initial Risk and Issues Arising

There is very limited potential for commercial abalone diving activities to impact on

Aboriginal archaeological sites along the coast. Similarly, commercial abalone diving on the NSW south coast has little or no impact on gazetted Aboriginal places.

Commercial abalone divers access the same abalone resources, which are mostly on nearshore reefs, as Indigenous people. Abalone has different meanings for different areas, and even between different family groups and may have been a trade item among Indigenous communities even before European settlement. For many groups, however, especially on the south coast, abalone is important.

Fundamentally, the Indigenous community concerns associated with the operation of the Abalone Fishery are about progressive loss of access to resources, with Indigenous communities considering that their right to maintain traditional fishing practices (i.e. fishing for traditional cultural and community purposes and responsibilities), conflicts with the current licensing system and allocation of non-commercial access to abalone resources. Two commercial abalone licences were held by Indigenous people some 20 years ago, but were sold by the holders. Currently, no Indigenous people hold shares or entitlements in the commercial Abalone Fishery. The concerns about progressive loss of access to resources have a history extending to the first issue of separate commercial abalone licences and reflect a combination of lost skills, lost income, poor communication, local community politics, and lost opportunity to participate in the fishery. In addition, there is no Aboriginal person currently attending ABMAC.

Response

Fundamentally, issues about Indigenous access rights to abalone and regulations as to how Aborigines collect abalone for community purposes require canvassing of potential changes to policy at a broader level than the commercial Abalone Fishery. The draft FMS, however, can address concerns about poor communication between Aboriginals and the abalone industry and the potential for Aboriginals to be employed in the industry.

The draft FMS proposes to address Indigenous issues as they relate to the Abalone Fishery as follows:

- Managing the fishery in a manner that is consistent with the Indigenous Fishing Strategy and Implementation Plan;
- Creating a code of practice for ensuring that abalone divers are aware of areas or items of cultural significance that may be affected by their activities and respond to new information as it becomes available;
- Explore ways to improve the communication between ABMAC and Indigenous people, in a culturally appropriate manner;
- In addition to the Indigenous position on ABMAC, possible ways of improving communication between the commercial sector and Indigenous communities include inviting other Indigenous people to discuss issues with the MAC and/or holding workshops on the south coast to resolve issues on an

annual or as-needs basis; and

- Encouraging Indigenous fishers and communities to be involved in the commercial sector, for example, through employment opportunities.

Predicted Outcome

Many of the Indigenous issues to do with commercial fishing in general (i.e. access rights and regulations as to how Aboriginals collect seafood for community purposes) involve policy issues at a broader level than at the individual fishery management strategies or cannot be resolved with reference to the commercial sector in isolation. Hence, these issues will not be resolved by the draft FMS. In addition, the potential for changes to regulations about how Aborigines collect abalone for community purposes also will need to be discussed at a broader level.

The initial risk of current operations of the fishery to Aboriginal sites and places was small and so there was limited need for changes under the draft strategy. Under the draft strategy, the use of the fishery code of practice will diminish this risk further.

The commitment in the draft strategy to improving communication between the abalone industry and Indigenous communities on the south coast of NSW and encouraging Indigenous participation in the commercial sector will go a long way to resolving many issues. Fundamental to this, is involvement of Aboriginal people in ABMAC as it a direct line of communication between the commercial industry, Aboriginal people and DPI. ABMAC provides the forum where strategies can be developed to encourage the involvement and employment of Aboriginal people in the commercial abalone industry.

European Heritage Sites

There was very little potential for the fishery to interact with, or impact on, heritage items of known historical significance, primarily shipwrecks. Continuation of the fishery as proposed under the draft strategy will not increase the risk of impacts on these items. Not withstanding this, the proposed fishery code of practice would instruct divers on how to operate when working near shipwrecks.

Justification for the Draft Fishery Management Strategy

The EIS highlights the importance of the commercial fishery for abalone in terms of employment and economic benefits to communities on the coast of NSW and for protection of the resource. The fishery directly employs 225 people, and has recently produced over 200 tonnes of abalone annually, valued at about $7-8 million at first point of sale. The economic and employment flow-on effects to local and regional communities are significant, and across the fishery the multiplier values are approximately 1.5-2.0 (i.e. every person directly employed in the fishery is worth 1.5 to 2 jobs in the community).

The nature of abalone diving, the TACC, the conservative size limit and negligible bycatch indicate the commercial fishery has minimal potential for causing adverse effects to the target species and ecology of reef environments. Of some concern was the risk the commercial fishery could potentially cause to some local populations of abalone. This risk would be minimised if proposals are implemented for improving

the way harvesting is managed at local scales. The draft FMS provides for a significant improvement to the economic viability of the fishery by providing flexible means for altering the number of divers and shareholdings where appropriate and for providing the means for more efficient and cost-effective services required to manage the fishery. Another issue for the commercial fishery is that of Indigenous consultation. Options for increasing consultation with regard to Indigenous issues are to be developed and implemented. Ongoing assessment of the impacts of significant management reforms is also proposed under the draft FMS.

The Abalone Fishery was assessed in terms of the Principles of Ecologically Sustainable Development (ESD). The fishery was found to be consistent with the major principles, particularly in terms of the Precautionary Principle. For example, the setting of a minimum legal size well above the reproductive age of abalone, the reliance of the TAC Committee on the Precautionary Principle in setting commercial quotas and the framework of rigorous scientific research and monitoring are highly consistent with ESD.

The draft FMS contains a range of immediate and short term actions, and establishes a range of programs that will require ongoing consultation with key stakeholders and the conclusion of implementation details. A significant level of work will be required to undertake the tasks which the EIS recommends for the long term sustainable management of the Abalone Fishery. In order to ensure that the fishery operates in an ecologically sustainable manner into the future and that the environmental risks are meaningfully reduced, it will be important to ensure that the strategies and plans subsequently developed under the draft FMS are implemented to fulfil the stated goals and objectives.

Consulting the Community

You are invited to comment on the Environmental Impact Statement on the Abalone Share Management Fishery in NSW, which is on public exhibition until 24 October 2005. The full EIS can be viewed at offices of the NSW Department of Primary Industries, the head office and regional offices of the Department of Infrastructure, Planning and Natural Resources, NSW Government Information Service, local councils and the Sydney office of Environment Centre (NSW) during normal business hours.

A CD copy can be purchased for $5 by contacting The Ecology Lab on (02) 9907 4440. It is also available on the NSW Department of Primary Industries website at: www.fisheries.nsw.gov.au/

Would you like to comment?

Write to :

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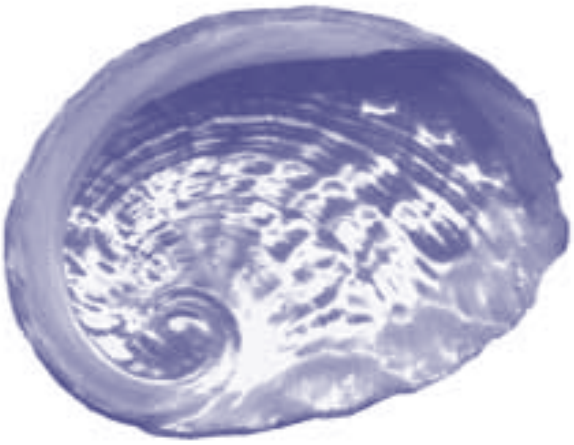
Comments must be received by
24 October 2005

Overview layout by Trevor Keeling. Images used in overview
by John Smythe and Trevor Keeling.

The Abalone Fishery
an overview



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