

OVERVIEW

# Environmental Impact Statement

ESTUARY PRAWN TRAWL FISHERY





# Introduction



In December 2000, the NSW Government made changes to the way fisheries are managed in NSW. These changes place increased emphasis on ensuring that fishing activities are environmentally sustainable.

The changes require the development of fishery management strategies for each major commercial fishery, the recreational fishery, the recreational charter boat fishery, fish stocking programs and for the beach safety (shark) meshing program. They also require an assessment of the environmental impact of those fisheries. The draft fishery management strategy and environmental impact assessment for the Estuary Prawn Trawl Fishery are joined together in this document termed the Environmental Impact Statement (EIS) for the fishery. Its structure is based on guidelines produced by Planning NSW.

This overview constitutes the first chapter (Chapter A) in the EIS. Chapters B, C and D present an analysis of the current management rules operating in the fishery, a description of the proposed management arrangements for the fishery for at least the next five

years (the draft strategy), and an outline of the alternative management approaches considered respectively. Together these chapters (Chapters A to D) comprise Volume 1 of the EIS.

Volume 2 comprises Chapters E to J, which contain an assessment of the biophysical, economic and social impacts of the management rules proposed for the fishery, and a justification for the chosen strategy.

Volumes 3 and 4 are appendices to the two main volumes.

This overview provides an introduction to the environmental assessment process. It briefly outlines the context within which the fishery operates, the management rules contained in the draft strategy, and the findings of the environmental impact assessment for the Estuary Prawn Trawl Fishery.

The public release of this EIS provides an opportunity for the community as a whole to review the environmental performance of the Estuary Prawn Trawl Fishery, and to have input into its future management.



## The estuary prawn trawl fishery



Estuarine prawn trawling began in Port Jackson in 1926 and today occurs in just five of the 130 estuaries in NSW; namely, Clarence River, Hunter River, Hawkesbury River, Port Jackson and Botany Bay. By the end of 2002 the fishery will operate in only four estuaries because Botany Bay has been designated a recreational fishing haven, and prawn trawling will cease.

In November 2001 there were a total of 289 fishing businesses entitled to operate in the Estuary Prawn Trawl Fishery. In 1999/2000 the value of the 527 tonnes of shellfish and finfish landed was approximately \$3.9 million at first point of sale<sup>1</sup>.

The fishery uses a single method (the otter trawl net) to target two species of prawn and squid, although in the process many species of fish and crustacean are incidentally caught. Over 80 species have at some time been captured in the Estuary

Prawn Trawl Fishery. The non-target species captured can be divided into a small number of species that have always significantly contributed to the marketed catch of the fishery (byproduct species), and the discarded portion of the catch (the bycatch).

The primary target species in this fishery are the eastern king and school prawns, though squid are also targeted in the Hawkesbury River. In recent years the volume of unwanted species in their nets by the use of bycatch reduction devices.

NSW Fisheries have records of reported landings of prawns (catches sent to market) since the turn of the century. Annual reported landings from the Estuary Prawn Trawl Fishery have only been separated from landings in the Estuary General Fishery and Ocean Prawn Trawl Fishery, however, since 1984/85. Total annual

<sup>1</sup> Based on Sydney Fish Market average monthly prices, and does not account for higher prices paid for exports or in other markets.

reported landings of eastern king and school prawns fell in most years between 1984/85 and 1993/94, but since then landings of eastern king prawn landings have remained stable and school prawn landings have risen. Patterns in landings and catch per unit effort for school prawns and eastern king prawns vary between estuaries in the Estuary Prawn Trawl Fishery.

Total annual reported landings of squid in all NSW waters have declined in most years since 1992/93, but catches of squid in the Hawkesbury River, where the majority of squid landed are caught in the Estuary Prawn Trawl Fishery, show an upward trend from 1984/85 to 1997/98, and then a fall over the past two years.

Fishing effort in the Estuary Prawn Trawl Fishery on the Clarence River has increased since 1984/85 whilst fishing effort in other estuaries has either declined or remained stable. These estimates of fishing effort should be treated with caution, however, because these do not allow for increases in effort associated with improved technology, including the introduction of planing hulled vessels, electronic fish finding equipment, motorised winches and synthetic net materials. The associated risks are dealt with in the environmental impact assessment.

## *Management of the fishery*

Input and output controls are the two broad types of management tools that can be used to manage fisheries. Input controls limit the amount of effort that can be applied to take shellfish and finfish in the fishery, thereby indirectly controlling the catch, whereas output controls aim to directly limit the catch.

The Estuary Prawn Trawl Fishery has historically been managed mainly through a series of input controls because of fluctuations in stock levels and the compliance issues associated with controlling unreported sales of prawns under an output control regime. The input controls used have included limits on the number and size of vessels, the size of gear used and time and area closures. Some output controls have also been used, however; for example finfish such as estuary cod, blue grouper, estuary perch and Australian bass that occur in estuaries have been completely protected from commercial fishing, and fish with a minimum size limit have been protected from prawn trawling in some instances.

Bycatch reduction devices to reduce incidental catches have been mandatory in the Estuary Prawn Trawl Fishery, except for the lower Hawkesbury River where squid is the primary target species, since December 2000.

## Environmental risks associated with the fishery

A preliminary environmental assessment of the current operations of the Estuary Prawn Trawl Fishery identified the following risks.

(i) Protection of key habitat and areas of environmental sensitivity

Saltmarsh, seagrass and mangroves are vital habitats for the long-term survival of many shellfish and finfish species, including most of the species landed in the Estuary Prawn Trawl Fishery. Areas of saltmarsh and seagrass habitats, in particular, have declined greatly in recent decades, mostly as a result of land use and water management practices, but fishing gear such as prawn trawl nets, can also affect habitat. There is insufficient information about the distribution of these key habitats in each of the estuaries fished by the Estuary Prawn Trawl Fishery or about the impact of trawling on the various habitat types.

(ii) Sustainability of the target species

The stock assessments available, which are based on information that has only low levels of precision, suggest that the eastern king and school prawns stocks may be growth-overfished. This means that individual prawns are being harvested at too small a size to take advantage of the growth potential of the species.

There is no stock assessment available for the squid stocks harvested in the Estuary Prawn Trawl Fishery. While there is little need for concern over catch levels in the Hawkesbury River, there is concern about the long term decline in total annual reported landings of squid in NSW.

## Environmental risks associated with the fishery CONTINUED

### (iii) Incidental catches

The amount of incidental catch in the prawn trawl net can have an impact on the ecosystem and the sustainability of the resource, especially considering that some bycatch species are targeted by other commercial and recreational fisheries. NSW Fisheries and industry have worked together in recent years to reduce this impact by introducing bycatch reduction devices into nets. However, little is known about the rates of survival of individuals that escape capture through these devices, or about whether all designs have been successful under commercial conditions at reducing incidental catch.

There are no stock assessments available for any of the species that comprise the byproduct of the Fishery or exploitation status except for one of the species involved.

### (iv) The multi-species character of the fishery in some estuaries

Overall, byproduct species contribute around 14% to the total annual reported landings of the Estuary Prawn Trawl Fishery. However, the high proportion of the catch in Botany Bay, Port Jackson and the Hawkesbury River made up of byproduct species such as octopus, trumpeter whiting and crabs suggests the fishery in these estuaries could be seen as multi-species in character, and that these species are being actively targeted. The impact of targeting these species on associated ecosystems is unknown.

### (v) Activation of latent effort

Approximately 50% of the entitlements in the Estuary Prawn Trawl Fishery contribute little or no active effort to the fishery and could be considered as latent (i.e. unused) effort. If these dormant entitlements become more active, there is a potential high risk to the sustainability of the resources and to the environment. There are currently no controls preventing the increased use of entitlements and while it is highly unlikely that this effort would all be activated at once, there is the potential for effort to increase significantly if economic circumstances change.

### (vi) Effects of trawling

Little is known about the impact trawling has on biodiversity in the estuaries fished by the Estuary Prawn Trawl Fishery. Most information about the impact of trawling comes from studies done in the oceanic environment and these have implicated otter trawling in changing the ecosystem. However, relating these conclusions to trawling in estuaries is not straight forward because the estuarine environment is far less stable and is impacted on by variation in natural elements. A study is currently underway in the Clarence River to assess the effects of trawling.

### (vii) Allocation of shellfish and finfish resources between fisheries

The species taken in the Estuary Prawn Trawl Fishery are also the target species of other commercial and recreational fisheries that operate in the same or adjacent waters. All sectors want access to these resources, so the challenge is how to share them in a way that is equitable but will not impact on the sustainability of the resources.

### (viii) Conservation of threatened and protected species, populations and ecological communities

Little is known about catches of threatened species in the Estuary Prawn Trawl Fishery, but it is thought that the impact of the fishery on threatened species populations and ecological communities is small. State and Commonwealth legislation require any such impacts to be mitigated by modifying or phasing out the activity causing the impact. It is important therefore to quantify and monitor any threatened species interactions, and to have a management framework that is adaptive, and allows any impacts identified to be managed.

### (ix) Conflict with other resource users and the community

The demands on our estuarine resources by commercial, recreational and passive users have never been greater. Commercial estuary prawn trawl fishers operate alongside commercial fishers working in other fisheries, recreational anglers, Indigenous fishers and a variety of other waterway users. While there has been a tendency, in the past, for each fishery to blame the actions of others for perceived declines in shellfish and finfish stocks, the reality is that all fisheries can have impacts and these impacts need to be managed.

Perceptions can also be important. Some members of the community dislike trawl fishing in estuaries and readily draw conclusions about the sustainability of such practices. Some commercial fishers on the other hand argue that the long history of stable catches means that these fishing practices are sustainable. A plan to achieve appropriate sharing of the waterways and seafood resources is needed.

### (x) Information needs and research

Considering the general lack of information available – for use in stock assessments, about the impacts of trawling, about key habitats and/or environmental sensitivity, about catches of threatened or protected species and about trophic interactions – the draft strategy will need to take a precautionary approach to future harvesting arrangements and will need to place increased emphasis on performance assessment, monitoring and research programs.

# Response of the draft strategy to the environmental risks

The draft strategy contains a series of measures that tackle the issues raised in the previous section. It proposes to make the Estuary Prawn Trawl Fishery as self regulating as possible, with penalties to apply if breaches occur. The draft strategy is a holistic resource management regime based on a combination of controls on gear, fishing effort, and catch.

To address these and other issues, the draft strategy offers eight major long-term goals for the management of the fishery:

1. to manage the Estuary Prawn Trawl Fishery in a manner that promotes the conservation of biological diversity in the estuarine environment
2. to maintain target and byproduct species harvested by the Estuary Prawn Trawl Fishery at sustainable levels
3. to promote the conservation of threatened species, populations and ecological communities associated with the operation of the Estuary Prawn Trawl Fishery
4. to appropriately share the resource and carry out fishing in a manner that minimises social impacts
5. to promote a viable commercial fishery (consistent with ecological sustainability)
6. to ensure cost-effective and efficient management and compliance in the Estuary Prawn Trawl Fishery
7. to improve the knowledge of the community about the operations and management of the Estuary Prawn Trawl Fishery
8. to improve the knowledge about the Estuary Prawn Trawl Fishery and the resources on which the fishery relies.

These management goals are underpinned by 28 specific objectives and 84 proposed management responses, including immediate actions, development of future management and enforcement measures, and scientific research and monitoring programs.

The major changes to management of the fishery proposed in the draft strategy are:

- modifying nets (including the ongoing development of more efficient bycatch reduction devices) to minimise the impact of trawling on fish habitat, benthic communities and the incidental catches (byproduct and bycatch) in the fishery
- prohibiting trawling over all seagrass areas, and areas of key habitat or environmental sensitivity
- introducing incidental catch ratios to discourage trawling in areas where the abundance of incidental species is high
- introducing limits on the landings of byproduct species
- introducing prawn counts (as a type of size limit) to protect small prawns from capture

- investigating the need to introduce a legal minimum length for squid
- introducing a scientific observer program to collect data on species composition and abundance, and size composition of individuals in the catch of the prawn trawl net and any occurrences of threatened or protected species
- proposing to commence fishery-independent surveys to provide biological information for, estimates of relative abundance of, the fishery resources harvested by the estuarine prawn trawl fishery
- issuing 15 year tradeable shares to estuary prawn trawl fishers in accordance with the category 2 share management fishery provisions of the *Fisheries Management Act 1994*
- using either the Total Allowable Catch Setting and Review Committee to recommend a maximum number of fishing days for the fleet, or the share system and minimum shareholdings provisions to ensure that the number of active endorsements in the fishery do not exceed historical and sustainable levels
- removing the ability for the owners of fishing businesses to nominate third parties to operate the businesses
- promoting research into biodiversity in estuarine systems, ecosystem functioning and the effects of fishing practices
- modifying the fishery's operation to implement measures sought by related natural resource management programs, such as the marine parks, aquatic biodiversity, marine pest, Indigenous Fisheries Strategy, and threatened species management programs
- developing a system for conducting formal stock assessments of the target species taken in the fishery, as well as ongoing monitoring of commercial landings of other retained species
- implementing an improved mandatory catch reporting system to improve the accuracy of commercial catch and effort data and to collect new data on interactions with threatened and protected species
- introducing greater deterrents for illegal activities, including the development of an endorsement suspension scheme and share forfeiture scheme based on a penalty point scale for serious offences and habitual offenders.

In addition to these proposed changes, the draft strategy incorporates a comprehensive performance monitoring system that will measure whether the stated management goals are being attained. The draft strategy identifies a series of indicators of management performance, and contains reference points that will trigger a review of the management rules if the fishery or fish stocks change beyond acceptable limits. All reviews of the management rules will be made public and completed within set timeframes.



# Environmental assessment of the draft strategy

This assessment uses the best available information to examine whether the proposed draft strategy adequately deals with the impacts of the Estuary Prawn Trawl Fishery on the shellfish and finfish resources, the biophysical environment and existing estuary prawn trawl fishers (economic and social consequences). The findings of this assessment are summarised in the table at the back of this document and discussed below.

## *Impact on the fish resources*

The draft strategy contains a series of measures that address the issue of sustainability of the shellfish and finfish harvested in the fishery. Overall, the measures aim to reduce management uncertainty by improving our knowledge of shellfish and finfish stocks, and the habitat and ecosystem on which they depend, by reducing the risk of overfishing retained and bycatch species, by appropriately sharing the fishery resources and by protecting key habitat areas.

Little is currently known about the stocks of shellfish and finfish retained by the Estuary Prawn Trawl Fishery. Of the target species, assessments of school and eastern king prawn stocks have commenced but there is no information on the targeted squid stocks. There is very little information on the stock status of byproduct species. Eastern king prawns and yellowtail stocks have been assessed as being fully fished using both fishery dependent indices of abundance, and ancillary information such as age structures or independent surveys, but the data is not yet incorporated into a formal model of the stocks. School prawn stocks have also been assessed as fully fished, however, this assessment has only been completed at an elementary level. Given that existing stock assessment information is incomplete considerable caution has been used when drawing conclusions from the data for retained species.

The likelihood of the Estuary Prawn Trawl Fishery overfishing the retained species was assessed through a risk analysis based on indices of species vulnerability and current fishing pressure. A precautionary approach was taken in this assessment, with the result that fishing pressure was automatically assessed as high for those species whose stocks had not been assessed. Current fishing effort was found to place nearly all (22 species) of the retained species at a high risk of being overfished, unless direct management responses are introduced. One species (yellowtail) was assessed as having a medium risk of being overfished by the fishery, requiring only indirect management action.

The draft strategy proposes the required direct management action to ensure the sustainability of retained species. The potential for

overfishing will be reduced by measures that directly address the risks associated with the fishery, through a combination of fishing gear restrictions (including improved bycatch reduction devices), controls on fishing effort, harvesting limits on target and byproduct species and effective monitoring of these limits, time and area based restrictions and stock assessments for the target species. The draft strategy does not treat each species in isolation, nor does it treat each species from the point of view of the Estuary Prawn Trawl Fishery alone. Rather, it is based on a holistic assessment that also takes into account interactions between target species, the impacts of trawling on habitats, and the cumulative effects of other fisheries or fishing sectors (including recreational fisheries).

Prawn stocks targeted by the fishery may be considered to be growth-overfished. The draft strategy proposes a range of measures to ensure these stocks sustainably managed, and to investigate the decline in State commercial landings of squid. Through establishing limits on byproduct species that will be monitored and reviewed, the draft strategy will ensure that the focus of the fishery remains on its target species. On the basis of maintaining sustainable school prawn stocks and reducing bycatch and habitat disturbance, a winter closure of the fishery in the Hawkesbury River should be investigated, though it is not proposed in the draft strategy.

The major issue for bycatch in the fishery is the large quantity of juvenile commercial and recreational species that are caught and discarded. Such discarding could reduce adult stocks of these species and impact commercial, recreational and Indigenous fishing sector catches. The draft strategy addresses this and other bycatch issues through a range of management responses that complement by the management arrangements in other fisheries and sectors. On the basis of the information provided, the proposed measures contained in the draft strategy are considered acceptable and should minimise adverse impacts of bycatch in the Estuary Prawn Trawl Fishery. However, unless research is done to develop ways of further minimising bycatch and the findings implemented, then a more precautionary approach may be required – for example larger area and time closures.

Based on the available data, the assessment of the proposed harvest strategies suggests an increase in the likelihood both of long-term stock sustainability and of bycatch reduction. While it is impossible to predict the effect of the draft strategy's implementation with any precision, given the uncertainty of stock size and the wide range of external environmental influences affecting the fishery, the draft strategy deals with this uncertainty by taking a conservative (precautionary) approach to future harvesting arrangements and by placing increased emphasis on performance monitoring, and scientific programs.

## Impact on the environment

By the end of 2002, the fishery will operate only in specified areas of four estuaries. Little is known about their biodiversity or habitats or the exact location and frequency of trawling within the permitted zone. While considerable literature exists on the adverse impacts of trawling on the environment generically, little specific information exists on the impact of trawling in NSW estuaries. The draft strategy should reduce uncertainty in the management of habitat issues through a commitment to research the impact of trawling on biodiversity and to map the habitats and actual area trawled in each estuary. Until such programs are developed and implemented, there will be a high degree of uncertainty associated with any assessment of trawling impacts on the biodiversity and habitats of the trawled estuaries.

In the absence of reliable data about these effects, a precautionary approach has been adopted. In determining the potential effects of the fishery, this assessment compared the allowable area of operation, methods and timing of the fishery with the fauna and habitat that could be affected. The findings were based on extrapolations from studies mostly on much larger and heavier fishing equipment, often from overseas and in offshore environments.

The assessment found that, as a result of the measures proposed in the draft strategy, the Estuary Prawn Trawl Fishery is most likely to directly disturb the unvegetated sediments found within the area that can be trawled but to a lesser extent may also indirectly disturb the fauna found associated with estuarine shoreline habitats. Overall the management responses of the draft strategy will prevent the fishery from operating in previously untrawled areas and reduce the current impact of trawling on habitat condition and biodiversity, through measures such as effort controls, a ban on trawling over seagrasses and a the introduction of a code of conduct. If the research and management responses contained in the draft strategy are not implemented, a more precautionary approach to trawling in estuaries would be required, possibly involving greater area closures and a reduction in current fishing effort.

The Estuary Prawn Trawl Fishery has the potential to affect a range of species listed as threatened or protected under either the *Fisheries Management Act 1994*, *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*. At this stage the fishery has been observed to directly capture only two species that are protected from commercial harvesting, namely the Australian bass and estuary perch.



Trawling in estuaries directly disturbs unvegetated sediment habitat, however, and could impact on associated threatened and protected species, such as the endangered green sawfish, which was last sighted in the Clarence River around 30 years ago. Prawn trawling operations have been identified as one of the likely causes contributing to the decline of the green sawfish in NSW. Prawn trawling has also been identified as one of the fishing methods that could result in incidental captures of the grey nurse shark though none have been recorded. It could possible also affect the little penguin population by depleting their food source.

The measures contained in the draft strategy should be effective in monitoring capture rates of threatened species and minimising their capture where they do occur. The proposed management measures are consistent with the recovery plans for the grey nurse shark and little penguin population and should reduce fishery-related impacts on this threatened species and population. A more precautionary approach is needed to minimise any possible indirect disturbance to threatened species caused by the fishery, as this appears to be the most likely form of impact on the majority of threatened species and species of international significance. The draft strategy should place greater emphasis on obtaining information about the effects on threatened species due to disturbance from trawling.

The environmental impact assessment has considered the eight factors listed under section 5A of the *Environmental Planning and Assessment Act 1979* in order to decide whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats. The assessment was based on a review of biological information derived from the various agencies responsible for those species, from published literature and from personal communications. The assessment concluded that the Estuary Prawn Trawl Fishery could significantly impact on green sawfish, if it were found in trawled estuaries. If this occurred, the strategy would need to include

## Environmental assessment of the draft strategy CONTINUED

such direct measures as the development of a code of conduct dealing with captures of the species, and targeted observer and research studies to assess and reduce any impacts on the species. Overall, however, the assessment concluded that the fishery alone would not have a significant effect on threatened species, populations or ecological communities or their habitats and, as such, a species impact statement was not required.

Due to the high level of uncertainty about trophic relationships in estuaries in NSW there is a high risk that trawling could substantially affect these relationships to the detriment of biodiversity. There are no management responses that specifically mitigate potential impacts of trawling on trophic structure in estuaries. However, research is proposed to investigate the effects of trawling on trophic relationships in specific habitats (e.g. unvegetated substrate) within estuaries of the fishery. The management responses that promote biodiversity are also likely to assist in mitigating the effects of trawling on trophic structure. The limited movement of fishers between the trawled estuaries in the Estuary Prawn Trawl Fishery limits the risk of spreading marine pests or diseases. Within an estuary the fishery could facilitate the spread of marine pests, such as the invasive marine alga *Caulerpa taxifolia*. To date, however, this species has not been found in any of the trawled estuaries, so further restrictions on the use and movement of fishing equipment are not required.

There are currently no proposals for the artificial enhancement of populations of fish and invertebrate species targeted by this fishery. Any such proposals would, at any rate, be subject to the provisions of the *Environmental Planning and Assessment Act 1979*.

The draft strategy contains a management response to develop a code of conduct that will include minimising the amount of oil and fuel in the bilge water of the trawlers. Only low levels of water pollution are likely to be generated by the fishery, mostly from the discharge of bilge water and water used to cook prawns. Considering the seasonal nature of the fishery, such events are likely to be of low to moderate frequency. This pollution should not have a significant impact on water quality as the estuaries trawled by the fishery have largely developed catchments with many sources of pollution and their waterways are busy with a variety of other boating users of which the fishery represents only a small fraction. Also, the carrying capacity of these relatively large and deep estuaries with wide entrances should quickly assimilate any pollution events from the fishery. Given the existing controls administered by the Waterways Authority and the Environment Protection Authority the vessels used in the fishery do not require any specific management measures for water quality issues, although sediment resuspension as a result of

trawling activity could increase turbidity and may require some investigation. The strategy is precautionary in proposing a code of conduct regarding water quality issues.

The fishery is considered to have minimal potential for significant adverse impacts due to light, noise, vehicle or boat emissions. Existing and proposed controls to limit the time and area fished should mitigate any potential impacts and monitoring of the level of complaints and the observer study will allow collection of data on their occurrence for use in future assessments.

There are some external factors (particularly land-based catchment uses, pollution, habitat degradation, climate and other estuarine users) that have the potential to significantly affect the estuarine habitats, the species harvested in the Estuary Prawn Trawl Fishery, and its operational area and capacity. These factors pose major challenges that go well beyond those contained within the parameters of the draft strategy. The draft strategy does propose useful options that will contribute to a more holistic management of estuaries and the fishery. Options in the draft strategy to help mitigate against external impacts include:

- the development of seafood safety protocols to reduce risks to consumers (this could result in temporary closures triggered by particular disease outbreaks or adverse environmental conditions)
- fishers reporting any detrimental impacts of external activities to NSW Fisheries
- contribution by fishers to habitat management policies and legislation
- increased fisher and fishery agency representation on boards and committees that regulate catchment activities and/or land uses liable to affect shellfish and finfish or their habitats
- ad hoc area closures.



Bycatch reduction device (Nordmøre-grid).

## *Economic impacts*

This is the first formal economic and social assessment of the Estuary Prawn Trawl Fishery of NSW. It has been compiled from a limited amount of existing information, and augmented by new economic and social surveys, and access to Australian Bureau of Statistics data.

The review of existing information shows that the Estuary Prawn Trawl Fishery is currently based in five estuaries located either in, or north of, Sydney. Estuary prawn trawl businesses have a diverse range of endorsements in other managed fisheries, particularly the Estuary General and Ocean Prawn Trawl Fisheries. The Estuary Prawn Trawl Fishery is seasonal, with a peak between November to May and comprises predominantly one person businesses, with some partnerships between fishers and limited corporate involvement.

Trends in licence values show no significant rise in the value of estuary prawn trawl endorsements in the last eight years, but this is a limited measure of economic performance due to restrictions on transfers of endorsements. The fishery is highly variable in capital investment levels, with some fishers having small boats, while others have significant investment in larger vessels, such as those also authorised in ocean-based fisheries.

Economic surplus exists in only 10% of all estuary prawn trawl businesses examined. Estuary prawn trawl businesses obtaining less than 20% of revenue from prawn fishing were more profitable than those obtaining more than 20% of revenue from prawn fishing. Those businesses currently operating below long term viability levels are effectively subsidised by forgoing returns on capital and labour, presumably to accommodate lifestyle. For these operators, increased management charges and any requirements to purchase shares will impact on their operational viability.

The assessment of management responses contained in the draft strategy are ranked on the basis of their potential larger scale economic impacts. The following issues are assessed:

- Under the draft strategy an annual reduction in the number of fishing businesses of 3% per annum is estimated due to the implementation of the category 2 share management regime, and minimum entry requirements at the fishing business level. Category 2 share management will give the remaining fishers improved fishing rights. The draft strategy will reduce 241 fishing businesses in 2002, to 205 in 2007. The most likely businesses to exit are those involving elderly fishers, latent effort holders and those businesses grossing below \$10,000

per year. Shares will be more readily purchased by the 10% of businesses in economic surplus. It is essential to monitor latent effort and constrain active effort levels, as stated in the strategy. The economic flow-ons from exiting businesses will be limited, however, due to their low catch history.

- The draft strategy proposes to address concerns about effort levels either through the implementation of minimum shareholdings on endorsements in each estuary, or by a total allowable effort limit, possibly related to the past fishing effort of fishers. These policies will enable estuary capacity to be contained within sustainable limits. Estuary based effort limitations (through shares or total effort days) are estimated to reduce the number of endorsed fishers by 5% (approximately 12 persons) during the first five years.
- Medium level impacts may come from the implementation of optimal prawn harvesting practices, such as prawn counts. Changes in food safety practices are also envisaged.
- Low level impact parts of the draft strategy involve closures for species protection and for weekend and public holidays. Recovery plans and the implementation of an owner-operator policy may impact fishers also.

A management cost appraisal of the draft strategy includes net economic revenues from fishing operations and all subsidies and management costs. The fishery commences in deficit and is significantly improved by the end of the draft strategy. The economic effectiveness of any restructuring needs to be monitored during the plan, as years of high prawn abundance would improve the viability of the fishery and its capacity for policy adjustments.

## *Social impacts*

Existing social data on fishers and their communities was supplemented by obtaining access to ABS data<sup>2</sup> and through a telephone questionnaire of 171 estuary prawn trawl fishers. The regional and community location of fishers was identified from licensing data and compared with the ABS data for a range of social indices including the SEIFA<sup>3</sup> index of disadvantage for rural communities, at the postcode level.

Total employment in businesses with an estuary prawn trawl endorsement is estimated as between 257 and 474 persons (full-time and past-time), though employment directly associated with the Estuary Prawn Trawl Fishery would be less than this. A

<sup>2</sup> Thanks to staff of the Social Science Unit, Bureau of Rural Science, Canberra.

<sup>3</sup> (Socio-Economic Index For Areas)

## Environmental assessment of the draft strategy CONTINUED

social profile of its fishers revealed fishers to be an aged, highly resident population, with substantial fishing experience and strong family involvement with fishing. Estuary prawn trawl fishers have a mean age of 47 years and 20% are in excess of 60 years of age.

Approximately 83% of fishers were insistent about their identity as fishers and were unable, or unwilling, to consider re training. This “psychic income” from fishing and problems in mobility of fishers are analogous to the NSW dairy industry.

The social assessment followed the environmental assessment guidelines issued by Planning NSW and ranked impacts into high, medium and low categories. It prioritised socio-economic issues and issues where policy changes require social processes to function properly for management to be most effective. The most highly impacting issues include the use of minimum business shareholdings, total effort limits, closures for species and on weekends and public holidays. Each of these changes has the capacity to impact fishers, families and local communities.

The major social changes from the draft strategy, after the closure of the Botany Bay fishery, involve the displacement of between 36 and 48 fishers in the first five years of the draft strategy through the implementation of minimum business shareholdings and proposed effort controls. Adjustment will probably impact part-time and older fishers, as 20% of fishers are over 60 years old,

and latent endorsement holders, or fishing businesses grossing less than \$10,000 per year.

The estuary prawn trawl fishing communities in the Clarence and Hunter are most vulnerable to changes from any socio-economic impacts under the plan. An estimated 36-48 fishers, with between 21-105 dependents, will be impacted to differing extents in proportion to their age and income dependence on the Estuary Prawn Trawl Fishery.

The social impact will be noticeable in estuary prawn trawl fishing communities, given the lack of alternative employment for many older fishers, but should also enable elderly fishers to retire with a payment from the sale of shares. Further research should prioritise understanding of fishing communities to reduce the cumulative impacts from successive management strategies.

### *Health impacts*

The Seafood Safety Scheme Regulation is based on the premise that some species and/or activities present a potentially higher food safety risk than others. An example of high-risk species is bivalve molluscs (shellfish), which are caught in the Estuary General Fishery, but are not to be retained for sale in the Estuary Prawn Trawl Fishery. The species retained in this fishery are considered to be a low food safety risk and thus do not require any special management arrangements.



## *Heritage impacts*

The activities associated with the Estuary Prawn Trawl Fishery are limited to associated boating, foreshore access and the use of trawl nets. Commercial fishing operations are likely to have only a marginal interaction with the European heritage resources, both structural and transport, within estuaries. With regard to shipwrecks, it appears likely that commercial prawn trawling in estuaries will have no impact and residual material evidence, having regard to the likely nature, bulk and mass of any residual material and the potential for sub-surface material to be covered by silt/sand. Nonetheless, in the reverse situation, it is possible for residual wreckage to pose a hazard, as a potential snag for nets.

There is abundant ethnographic and archaeological evidence for past use of estuaries and beaches by Indigenous people, and of the importance of resources from these environments to Indigenous

economies and lifestyles. In the cases of both Indigenous sites along the banks of estuaries, and Indigenous sites along the dunes of ocean beaches, however, the overall risk that activities authorised by the draft strategy will detrimentally impact on Indigenous cultural heritage is considered to be low, requiring no specific management measures.

## *Indigenous issues*

There are several other concurrent policy development initiatives by the NSW Government that will affect the interaction of Aboriginal fishers with the Estuary Prawn Trawl Fishery. In particular, NSW Fisheries has been consulting with the Aboriginal community on an Indigenous Fisheries Strategy.

Ongoing review of the fishery management strategy will be essential to ensure that any changes in the policy approach to Indigenous fisheries are incorporated.

# Justification for the draft strategy

The EIS highlighted the importance of the Estuary Prawn Trawl Fishery to the community in terms of employment, supply of seafood and economic benefits. There are approximately 500 people employed in association with the Estuary Prawn Trawl Fishery. The fishery contributes approximately 500 tonnes of fresh seafood annually for general consumption, and recent market surveys clearly indicate the increasing consumption of seafood products and demand for locally caught shellfish and finfish. The annual landed value of the fishery is approximately \$4 million, with almost all the first sale value staying within local communities.

If the fishery were not to continue, then much of the production may be absorbed by other fisheries. The extent to which this would happen would vary between estuaries because some of the estuaries have other estuary based fisheries and/or are ports for large ocean going fleets of prawn trawlers. Both these catching sectors would be likely to take a share of any prawn catch foregone by not allowing trawling in estuaries.

However, the production of squid in the Hawkesbury River might well be lost.

The main arguments for maintaining the Estuary Prawn Trawl Fishery are the employment it generates; its importance to regional economies; and its capacity to variously produce: a high quality squid product, to help satisfy an elastic demand for prawns and to provide live prawns for specialised seafood markets and small prawns for the bait market.

The EIS concluded that the management responses proposed by the draft strategy provide for an appropriate allocation of the resource, and incorporate those measures needed to address the various principles of ecologically sustainable development, including the precautionary principle.



# How the environmental impact statement was developed

The EIS incorporates an assessment of the likely environmental impacts if the draft strategy was to be implemented. As well as satisfying the environmental assessment requirements of the *NSW Environmental Planning and Assessment Act 1979*, the EIS will also be submitted to the Commonwealth Government to meet assessment requirements for the *Environment Protection and Biodiversity Conservation Act 1999* and the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*. This is the third time in NSW that the widely accepted environmental impact assessment process has been applied to fisheries assessments. This methodology has already been applied to the Estuary General and Ocean Hauling Fisheries.

## *Development of the draft strategy*

The draft strategy for the Estuary Prawn Trawl Fishery was compiled with significant input from the Management Advisory Committee (MAC) for the fishery. The MAC includes elected representatives of the commercial estuary trawlers as well as representatives of recreational fishers and the Nature Conservation Council. Input into the draft strategy was also sought from all fishers endorsed in the Estuary Prawn Trawl Fishery, the Minister for Fisheries' advisory councils on conservation, recreational fishing and commercial fishing (which includes commercial fishers from other fisheries), and the Fisheries Resource Conservation and Assessment Council. Government agencies, such as Planning NSW and the Commonwealth's Environment Australia, have also been consulted during the drafting of the EIS, as have professionals in the fields of aquatic research and environmental impact assessment.

The draft strategy contains all the proposed rules for management of the fishery, but it is much more than a collection of rules. The draft strategy contains the objectives for the fishery, a detailed description of the way the fishery operates, and describes the management framework for at least the next five years. It also outlines a program for monitoring the environmental, social and economic performance of the fishery, establishes trigger points for the review of the draft strategy, and requires annual reporting on performance in order to ensure that the draft strategy meets its objectives.

## *Development of the environmental impact assessment*

It is important to understand that the environmental impact assessment and the draft strategy have been developed concurrently, in a series of steps. The draft strategy assessed here is in fact the third draft of the strategy. The process is designed to give early feedback to the MAC 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 impacts identified during the assessment process.

One difference between assessing the impacts of an existing fishing industry and assessing, for example, a new building development is that the fishing industry already exists. Consequently, any changes to fishing practices and levels of harvest will have direct social and economic impacts on these already-established fishing and related industries. It is important that when the impacts of proposed changes are assessed time is allowed, where appropriate, for industry to adjust to any changes required.

In comparison to our knowledge of terrestrial resources, less is known about aquatic ecosystems, and even less about estuarine ecosystems; this makes any assessment of fishery impacts more difficult than is the case with many other natural resources. The environmental assessment acknowledges such uncertainty and, where there is little information upon which to make a decision about an issue, 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 damage to fish stocks, lack of full scientific certainty should not be used as a reason for postponing measures to prevent that damage.



# Other management initiatives relevant to the estuary prawn trawl fishery

Apart from the management responses contained in the draft strategy, there are a number of initiatives currently underway by the NSW Government that may affect existing allocation arrangements in estuaries, namely the recreational fishing area process, the establishment of marine protected areas and the development of an Indigenous Fisheries Strategy.

- *Recreational fishing havens.* A general recreational fishing fee was introduced in March 2001. Money raised by the fee is being used to improve the quality of recreational fishing. A major initiative funded by this fee has been, after extensive community consultation, the announcement that 29 areas are to be protected from commercial fishing. These fishing havens aim to resolve long standing resource-sharing issues in areas popular with large groups of anglers, and involve closing small and large areas to commercial fishing. Under this process, sufficient commercial fishing businesses will be bought out to ensure there is no net transfer of commercial fishing effort into other areas, and fair compensation will be offered to the owners of fishing businesses that are acquired. The new areas to be protected from commercial fishing include Botany Bay which directly relates to the Estuary Prawn Trawl Fishery. For a complete list of the new recreational fishing havens that have been announced, refer to the NSW Fisheries website: [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au).
- *Marine protected areas.* NSW is committed, under national and international agreements, to the conservation of marine biodiversity and to the ecologically sustainable use of marine resources. Nationally, all states and territories are working

towards establishing a national representative system of marine protected areas. In NSW, the term 'marine protected areas' includes large multiple-use marine parks, small aquatic reserves, and the marine components of some national parks and nature reserves.

Together with sustainable fisheries management and coastal protection, marine protected areas play a vital role in conserving marine ecosystems and in maintaining natural processes. At the time of writing, three marine parks had been created and consultation was occurring over the possible creation of an additional marine park.

- *Indigenous Fishing.* Changes to fisheries management policies, practices and laws have increasingly impacted on Indigenous fishing activities over the years. Commercial and recreational uses of fisheries resources can cause concerns for Aboriginal communities as these practices may interfere with cultural activities. Many Aboriginal people have also expressed an interest in expanding their involvement in the commercial use of fisheries resources, thereby contributing to their financial independence. Indigenous communities also want to participate more in the management of the resource. The Government has been consulting about a NSW Indigenous Fisheries Strategy with Aboriginal people and fisheries stakeholder groups.

Aboriginal people agree that resource sustainability remains paramount and any strategy must take into account the impacts of such practices on biodiversity.

# Environmental Impact Assessment Summary Table

Issue	Component	Impact
<b>Impact of the fishery on fish resources</b>	Retained species	<ul style="list-style-type: none"> <li>• Potential for growth overfishing</li> </ul>
	Bycatch	<ul style="list-style-type: none"> <li>• Mortality of juvenile and undersized commercial and recreational species</li> </ul>
		<ul style="list-style-type: none"> <li>• Mortality of other non-target species</li> </ul>
	Bait	<ul style="list-style-type: none"> <li>• No bait used in fishery</li> </ul>
<b>Impact on the biophysical environment</b>	Biodiversity	<ul style="list-style-type: none"> <li>• Change in ecosystem function or reduced diversity</li> </ul>
	Habitat damage	<ul style="list-style-type: none"> <li>• Destruction of estuarine habitat</li> </ul>
	Threatened and protected species	<ul style="list-style-type: none"> <li>• Mortality due to direct capture or disturbance</li> </ul>
	Trophic structure	<ul style="list-style-type: none"> <li>• Change in trophic structure and function</li> </ul>
	Translocation of organisms	<ul style="list-style-type: none"> <li>• Potential for spreading disease and introduce exotic and pest species</li> </ul>
	Fish health and disease	<ul style="list-style-type: none"> <li>• Increase risk of disease</li> </ul>
	Water quality	<ul style="list-style-type: none"> <li>• Potential affect on fish health</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>• Disturbance to fish, birds and wildlife</li> </ul>
	Light	<ul style="list-style-type: none"> <li>• Disturbance to fish, birds and wildlife</li> </ul>
	Air quality	<ul style="list-style-type: none"> <li>• No significant impact</li> </ul>
	Energy & Greenhouse	<ul style="list-style-type: none"> <li>• No significant impact</li> </ul>
	External factors	<ul style="list-style-type: none"> <li>• Decrease area of trawl grounds</li> <li>• Pollution of estuarine waters</li> <li>• Destruction of habitats</li> <li>• User conflicts</li> </ul>
<b>Economic impacts of the draft FMS</b>	Economic viability	<ul style="list-style-type: none"> <li>• Poor economic viability of fishing businesses</li> </ul>
<b>Social impacts of the draft FMS</b>	Employment and community values	<ul style="list-style-type: none"> <li>• Reduction in number of fishers</li> </ul>
	Health and safety	<ul style="list-style-type: none"> <li>• Fishers' well being</li> </ul>
		<ul style="list-style-type: none"> <li>• Provision of poor quality seafood</li> </ul>
	European heritage	<ul style="list-style-type: none"> <li>• Loss or damage of heritage sites</li> </ul>
Indigenous heritage and issues	<ul style="list-style-type: none"> <li>• Loss or damage to cultural sites, resource allocation</li> </ul>	

# Summary Table

	Sources of Impact/Concern	Assessment of Level of Environmental Risk	Programs Proposed
	<ul style="list-style-type: none"> <li>Activation of latent effort</li> <li>Poor understanding of species</li> <li>Uncertainty of stock status</li> <li>Level of active effort</li> <li>Habitat destruction</li> </ul>	High for 21 species, including target species – eastern king prawns, school prawns and squid; Medium for 1 species (yellowtail)	Controls on active stock assessments; time and area closures
	<ul style="list-style-type: none"> <li>Direct capture through non-selective method of fishing and discard mortality</li> <li>Contact without capture, damage from escape through trawl net</li> <li>Lack of knowledge of bycatch species</li> </ul>	High – capture of juveniles of commercial and recreational species; High – discard mortality	Use and ongoing development of handling methods; reduction devices
	<ul style="list-style-type: none"> <li>Direct capture through non-selective method of fishing and discard mortality</li> <li>Contact without capture, damage from escaping through trawl net</li> <li>Lack of knowledge of bycatch species</li> </ul>	High – direct capture and discard mortality	Closures in areas of high discard mortality; handling methods
	<ul style="list-style-type: none"> <li>Ghost fishing from torn netting</li> </ul>	Nets rarely lost or torn – not applicable	Not required
	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>	Not applicable	Not applicable
Ecology	<ul style="list-style-type: none"> <li>Poor understanding of ecology of estuaries and non-target species</li> <li>Habitat destruction</li> </ul>	High	Time and area closures; impact study on non-target species
	<ul style="list-style-type: none"> <li>Poor understanding of distribution of estuarine habitats and the impact of trawling on habitat</li> </ul>	Low to high depending on key habitat type; e.g. medium for seagrass, high for unvegetated sediments	Time and area closures; impact study on habitat; gear changes and modifications
	<ul style="list-style-type: none"> <li>Poor understanding of threatened species interactions and the impact of trawling on threatened species</li> </ul>	Low for most species; Low to medium for grey nurse shark, the little penguin population; Medium for estuary perch, Australian bass; Medium to high for green sawfish	Bycatch reduction and captures; international recovery plans; closures
	<ul style="list-style-type: none"> <li>Poor understanding of trophic structure of estuaries and of the impacts of trawling on trophic structure</li> </ul>	High	Contribute to research; Other proposed measures; support for threatened species
	<ul style="list-style-type: none"> <li>Movement of fishing vessels between fishing zones</li> </ul>	Low for most estuaries because few vessels operate in more than one zone	Implementation of zoning or equivalent
	<ul style="list-style-type: none"> <li>Damage from escape through trawl nets</li> <li>Poor understanding of the impact of trawling on fish health</li> </ul>	Medium	Adopting AQIS guidelines
	<ul style="list-style-type: none"> <li>Sediment re-suspension</li> <li>Fuel discharged into water</li> <li>Non-toxic dumping of debris overboard</li> <li>Discharge of processing waste</li> <li>Release of heavy metals and anoxic conditions</li> </ul>	Low to medium	Code of conduct; management and monitoring
	<ul style="list-style-type: none"> <li>Operation of trawl gear</li> </ul>	Low – due to limited time of year of operation in most estuaries	Time and area closures
	<ul style="list-style-type: none"> <li>Boat operation at night</li> </ul>	Low – due to limited time of year of operation in most estuaries	Time and area closures
	<ul style="list-style-type: none"> <li>Engine emissions</li> </ul>	Low – due to limited time of year of operation in most estuaries	Not required
	<ul style="list-style-type: none"> <li>Engine emissions</li> </ul>	Low	Not required
	<ul style="list-style-type: none"> <li>Land based development</li> <li>Water based activities</li> <li>Climate change</li> </ul>	High	MAC and NSW Fisheries Act
	<ul style="list-style-type: none"> <li>Structure of fishery</li> </ul>	High	Restructure of the fishery
	<ul style="list-style-type: none"> <li>Structure of fishery</li> </ul>	High	The proposed industry; themselves; effort
	<ul style="list-style-type: none"> <li>Use of winches, machinery and boats</li> </ul>	Low	Not required
	<ul style="list-style-type: none"> <li>Handling and processing of fish</li> </ul>	Low	Adopting Food Safety
	<ul style="list-style-type: none"> <li>Area of trawling</li> </ul>	Low	Not required
Operation	<ul style="list-style-type: none"> <li>Area of trawling and maintenance of boats</li> </ul>	Low to medium	Appropriate policies

Programs Proposed in the Draft FMS to Mitigate Impacts	FMS Likely to Reduce Risk?
Controls on active fishing effort through total allowable fishing days or restructuring; stock assessments for target species; limits on gear; limits on landings and monitoring; time and area closures; investigate a winter closure for the Hawkesbury River	Yes – if there is high compliance, accurate catch returns and stock assessments are adequate
Use and ongoing development of bycatch reduction devices; time and area closures; handling methods; scientific observer programme to monitor effectiveness of bycatch reduction devices	Yes – for capture of juvenile species Inadequate – for discard mortality
Closures in areas and times of high incidental catches; handling methods and gear modifications	Unknown
Not required	–
Not applicable	Not applicable
Time and area closures; mapping of habitats within trawl area; prohibit trawling over seagrasses; impact study on biodiversity	Potentially – subject to appropriate action being taken following the results of impact studies and mapping
Time and area closures; mapping of habitats within trawl area; prohibit trawling over seagrasses; impact study on biodiversity; continue to prohibit wilful damage of marine vegetation; gear changes and restrictions	Yes
Bycatch reduction strategies; area and time closures; observer survey; identification of sightings and captures; inter-agency threatened species management; support for threatened species recovery plans; code of conduct	Yes, however more specific measures needed for green sawfish
Contribute to research into ecological function Other proposed measures that may assist: mapping environmentally sensitive habitats; support for threatened species recovery plans; area and time closures; constrain fishing effort	Unknown, and not likely to be known until there is a better understanding of trophic structure in estuaries
Implementation of measures in accordance with Australian Emergency Marine Pest Plan or equivalent	Yes
Adopting AQIS guidelines, when developed; specific research projects	Unknown
Code of conduct; existing Waterways Authority and Environmental Protection Agency management and regulations	Yes
Time and area closures	Yes
Time and area closures	Yes
Not required	–
Not required	–
MAC and NSW Fisheries contribution and commitment to total catchment management	Yes – to the extent that the FMS can influence other Government policies
Restructure of the fishery is proposed through additional effort controls and/or minimum shareholdings	Yes
The proposed industry funded restructure will allow fishers exiting the industry to reestablish themselves; effort controls will help to ensure greater employment security in the long term	Unknown
Not required	–
Adopting Food Safety Programme guidelines, when developed	Yes
Not required	–
Appropriate policies developed in response to emerging issues	Yes



# Consulting the community

You are invited to comment on the Environmental Impact Statement for the Estuary Prawn Trawl Fishery, which is on public exhibition until 15 April 2002. The full EIS can be viewed at NSW Fisheries Offices, the head office and regional offices of Planning NSW, NSW Government Information Service, local coastal councils

(including relevant Sydney councils) and the Sydney office of the Environment Centre (NSW) during normal business hours. A paper or CD copy can be purchased for \$25 (includes GST). It is also available on the NSW Fisheries website at [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au).

## *Need more information?*

For enquiries relating to the Estuary Prawn Trawl Fishery, please phone (02) 6645 1321.

For enquiries relating to the environmental impact statement, please phone (02) 9527 8524.

Or visit: [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au)

## *Want to comment?*

Write to: Environmental Impact Statement Submission  
Estuary Prawn Trawl Fishery  
PO Box 21  
CRONULLA NSW 2230

Fax: (02) 9527 8576  
(marked attention "Estuary Prawn Trawl EIS Submission")

Email: [estuarytrawl.eis@fisheries.nsw.gov.au](mailto:estuarytrawl.eis@fisheries.nsw.gov.au)

If you wish your submission to remain confidential, it should be so marked.

**Comments must be received by 15 April 2002**

(Photos: John Matthews, Steve Kennelly, Matthew Broadhurst, NSW Fisheries)

