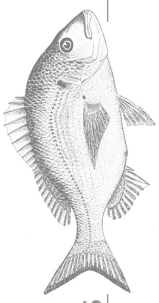
Fishery Management Strategies
Performance Report 2004

NSW DEPARTMENT OF
PRIMARY INDUSTRIES



Overview

This report summarises the performance of the fisheries in NSW that have approved fishery management strategies (FMS), namely the Estuary General, Ocean Hauling and Estuary Prawn Trawl fisheries.

Fishery management strategies and associated environmental assessments are being prepared for each major fishing activity, in order to address the requirements of NSW and Commonwealth legislation. Additional information can be obtained from the NSW Department of Primary Industries website at: – www.fisheries.nsw.au/com/env-assess.htm

In recent years, many significant changes have been made to the way that commercial fisheries are managed in NSW. A high priority has been placed on protecting fish stocks, habitat, and threatened species, as well as improving the way that fishery resources are shared amongst user groups. Many of the new arrangements are being introduced through the implementation of fishery management strategies, whilst others are part of broader natural resource management programs.

Some of the key changes include:

- stronger fishing rules to help overfished species recover,
- improvements in the selectivity and other changes to fishing nets, including the use of bycatch reduction devices,
- establishment of recreational fishing havens involving the buy back of commercial fishing entitlements,
- changes to the areas fished to protect important fish habitat and stocks,
- the development of a scientific observer program to monitor the effect of fishing gear on species, and
- the implementation of share management arrangements for all major commercial fisheries to give fishers greater security and an incentive to improve stock husbandry and fishing practices.

The NSW commercial fishing industry has played a major role in introducing many of the new arrangements. In particular, work on bycatch reduction devices, gear selectivity and local agreements to restrict fishing at times when there are large numbers of small fish will significantly reduce the environmental impacts of their industry.

This is the first performance report prepared under the requirements of the approved fishery management strategies. The report describes how performance reporting is used as a proactive tool under the fishery management strategies, including examples showing how this is done for individual species. Detailed information is presented on the performance indicators and triggers for 34 species based on data for the 2002/03 financial year, as well as information on a range of other indicators and triggers. Information is also presented on the implementation of the management actions outlined in each of the management strategies up to June 2004.

In summary, the trigger points for the majority of the performance indicators were not activated, that is, the indicators fall within acceptable ranges. However, the trigger points for several performance measures were activated as expected[1], thereby triggering investigations and consultation processes to determine the cause and whether any remedial action is warranted. In all cases, the cause can be readily explained by natural variations in fish stocks or changes in harvesting or resource sharing arrangements, without the need for any immediate remedial action.

Additionally, many of the new and ongoing actions required under the approved fishery management strategies have been fully implemented, and substantial progress has been made towards implementing others.

Work is currently underway to refine the approach for measuring the performance of fisheries in NSW, for example, by reviewing the performance indicators and trigger points for each species and developing indicators and trigger points for monitoring socio-economic factors. Changes will also be made to include any improved performance indicators under the fishery management strategies that are currently being prepared.

The performance reports prepared under the fishery management strategies will be prepared and made publicly available every two years.

Performance indicators and trigger points

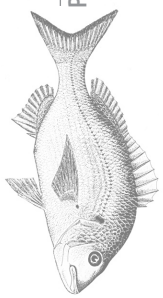
Background

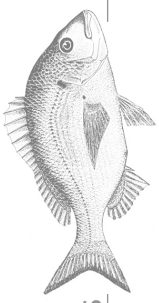
The fishery management strategies contain several goals that are aimed at conserving aquatic habitats, biodiversity and threatened species, maintaining stocks of harvested fish species, sharing fisheries resources, promoting viable commercial fisheries, delivering cost effective management arrangements, and improving our knowledge of our fisheries and fish resources. A number of performance indicators have been specified to help assess whether the goals under each strategy are being achieved. Trigger points for each performance indicator are being used to detect major changes in the fisheries.

The use of performance indicators and trigger points in fisheries management requires careful application and interpretation. Firstly, it is often not possible to identify a single direct indicator for most goals given that the goals are usually broad. Instead, it is necessary to use a set of indicators to assess the overall performance of a fishery. Similarly, it is often important to monitor the combined effect of multiple fisheries, given that many species are harvested in several fisheries and many fishing businesses hold entitlements in several fisheries.

Secondly, it is important to recognise that performance indicators, particularly those involving fish stocks and catches, have fluctuated historically and will continue to fluctuate in the future. This is typically the result of natural environmental changes, changes in market preferences and changes in the fisheries themselves. Such variations can make the specification of appropriate trigger points difficult. If the trigger points are not conservative enough, then important changes to the fishery or the stock may be missed. On the other hand, if the trigger points are too conservative there will be too many 'false alarms'.

[1] The trigger points for species landings were set at conservative levels such that approximately 80% of landings fall within the acceptable range, and 20% would be expected to trigger a review.





The trigger points being used under the fishery management strategies are being set in a conservative way so that relatively modest changes in an indicator can cause a trigger point to be activated. Whilst the activation of a trigger point does not necessarily imply that there is a problem with a fishery, it draws attention to the situation so that the matter can be investigated at an early stage. If necessary, further management action can be taken to address any emerging problem.

Thirdly, the commencement of the fishery management strategies brought many significant changes to the way the Estuary General, Ocean Hauling and Estuary Prawn Trawl Fisheries operate (as summarised later in this report). The changes will take differing times to lead to actual changes in the fisheries and the aquatic ecosystems on which they depend. The performance indicators and trigger points used in the strategies are generally designed to monitor changes between consecutive years. For those indicators, the 2002/03 data has been obtained as a benchmark and will be used for comparison in the 2004/05 analysis. Consecutive year triggers will, therefore, be reported on in the second and subsequent reports.

Fourthly, some performance indicators and trigger points require further work to develop before they can be applied. For example, it is not possible to establish baseline triggers for threatened species interactions until data is obtained from fishers catch reporting and / or from the observer program.

The system of performance indicators and trigger points will require ongoing review and improvement. For example, indicators of stock status that are better than those based on commercial landings data only are under development, and will be introduced on an ongoing basis into subsequent performance reports. In addition, indicators that were included in the original fishery management strategies, but which are not likely to contribute to the improved management of the fisheries may be nominated for removal from the reports. Such decisions will be taken only after consultation with the relevant fisheries advisory bodies.

Whilst the majority of indicators and trigger points in this report relate to commercial landings of species, there are also a number of administrative type indicators. Such indicators are used to measure compliance rates, and other matters relating to the management of commercial fisheries. These indicators are designed to identify trends in fishing activities or market forces, that may not necessarily be detected by changes in commercial catches.

Monitoring fish stocks in NSW

Fish stocks in NSW are monitored in several ways to detect important changes. Data for this monitoring comes from several sources. The first source is the commercial fishers, who submit monthly returns that summarise their landed catch and the fishing effort used in their operations. These data can be used in two ways (described in turn).

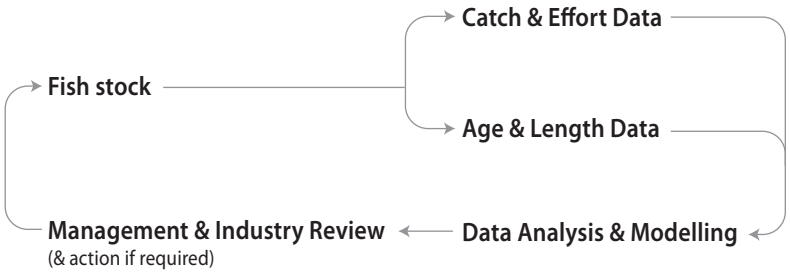
The first and simplest method is to monitor landed catch. Large changes to landings can indicate changes to fishing effort, management of the fishery, market factors and/or fish abundance. This performance report includes a summary of the trigger points defined in the fishery management strategies based upon commercial fish landings. These trigger points are activated if large changes in commercial landings occur.

The second method to monitor stocks (using catch and effort information) is to calculate catch per unit of effort (CPUE). This ratio is often assumed to be proportional to the abundance of fish; but such an assumption can be extremely misleading because of the behaviour of the fish and the fishers. CPUE is an informative indicator in some instances of the state of fish stocks but must be interpreted carefully. Trigger points based upon CPUE will be included in the FMS performance reports after appropriate consultation with fisheries advisory bodies.

The second source of data is the programs undertaken by the NSW Department of Primary Industries to monitor the age and lengths of individual fish. These data can be used to verify patterns of recruitment and estimate the mortality rate of fish. These more advanced methods of stock monitoring are planned to be introduced into the FMS performance reports within the next two years.

Stock assessment is the science of integrating various sources of data into a model (or models) of fish stocks. Predictions from these models can be used by managers and industry to understand the consequences of decisions. Many of these models estimate the actual biomass of fish stocks; but the uncertainty associated with these estimates is usually large.

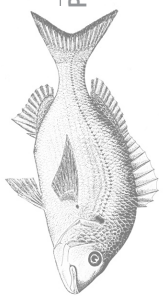
Indicators (and associated trigger points) from catch/effort data, age/size monitoring programs and stock assessment models are used to send signals to managers and industry about the state of a fish stock. Managers and industry act on these signals to keep stocks at sustainable levels. The figure below illustrates the feedback loop used by the NSW Department of Primary Industries to manage our fish stocks.

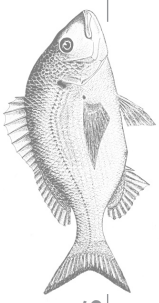


Performance indicators and trigger points for landed species

Indicators showing the status of fish stocks is a crucial part of the management of a sustainable fishery. A full resource assessment strategy had not been developed at the time when the approved fishery management strategies were being prepared. Such a strategy is currently being finalised. In the interim, landed catch has been used as an indicator of stock and fishery status.

The Estuary General and Ocean Hauling fishery management strategies each specify the upper and lower trigger points for commercial landings of primary/target species and key secondary/byproduct species. These trigger points were based upon state-wide landings from all commercial fisheries. For this report, a combination of the Estuary General and Ocean Hauling landings for the periods 1999/00 and 2000/01 are compared to the landings that were reported during the period 1984/85 to 2000/01. Data from the 1999/00 and 2000/01 period is being used as this was the catch data used in the fishery management strategies and also published in the environmental impact statements for those fisheries.





The trigger points are designed to detect changes that fall outside the range of where 80% of landings had occurred during the period 1984/85 to 2000/01. That is, 20% of landings are expected to activate trigger points and generate a review into the reasons why such a change in landings has occurred.

The Estuary Prawn Trawl Fishery Management Strategy specifies the upper and lower trigger points for CPUE for target species. The trigger points for target species for this fishery were set on an estuary by estuary basis to acknowledge the difference in target species and fishing that occurs between each estuary. This performance report compares the trigger points published in the fishery management strategy with the landings in the 2002/03 year.

Responding to activated trigger points of commercial landings

Appendix 2 of this report presents a summary of the trigger points and the associated indicator values for the Estuary General, Ocean Hauling and Estuary Prawn Trawl Fisheries for 2002/03.

The trigger points for the majority of the indicators were not activated, that is, the indicators fall within a range that show that the status of the fish stocks is acceptable. However, several of the trigger points were activated as expected, thereby triggering investigations and consultation processes to determine the cause and whether any remedial action was warranted. Consultation has occurred with relevant industry advisory bodies over all trigger point activations. In all cases, the cause can be readily explained by natural variations in fish stocks, changes in harvesting or resource sharing arrangements, without the need for any immediate remedial action. A summary of the likely reasons for trigger activation is shown in Appendix 2.

Investigations into the reasons trigger points were activated identified a number of consistent themes. These included the natural high variation in catches for many species, the effects of the drought on river discharge and fish behaviour, and changes to access arrangements as a result of the commercial buy-back of entitlements and the establishment of recreational fishing havens.

The Estuary Prawn Trawl FMS included a number of trigger points relating to byproduct species. The analysis of landings data showed that these landings were relatively small and subject to substantial variation. Whilst a number of triggers were acitivated, this is to be expected upon critical analysis of small and highly variable landings. Investigations and consultation with the Estuary Prawn Trawl MAC were carried out, and no recommendations for remedial action are warranted. Whilst the byproduct trigger points have been analysed, the indicators have not been included in this report for the reasons outlined above.

Three case studies are presented in Appendix 1 that outline how indicators and trigger points are being applied for some selected species, namely yellowfin and black bream; Australian salmon and pipis. Similar in-house analyses are being undertaken for all primary, target and key secondary species from all fisheries. The resource assessment reporting system under development will improve the efficiency of generating these type of reports so that more species can be presented in this form in the future.

Implementation of management actions

The approved fishery management strategies include a range of objectives and management responses to achieve the goals set for each fishery. Whilst some of the management responses reflect current management arrangements, some require the implementation of new actions or programs that affect the way the fishery operates. A full summary of the progress that has been made to implement the management responses up to June 2004 is presented in Appendix 3.

There have been a number of major achievements for the fishing industry in NSW over the past few years. These include the move to share management, new methods for assessing the status of fish stocks, and the introduction of new fishing practices to reduce impacts on non-retained fish. A number of the improved fishing practices have come from ideas put forward by industry.

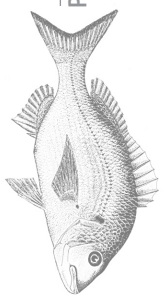
The move to share management will see all major commercial fisheries operate under a framework which will give fishers a tradeable long term property right. The share framework will also give fishers the ability to operate in a contemporary business environment, and encourage long term decisions to ensure a sustainable future for the industry.

To date, criteria for the allocation of shares has been developed in consultation with the commercial fishing industry, and eligible fishers have been invited to apply for shares. The next stages in this process will to be to limit access to each fishery to the share holders, and the development and commencement of a share management plan for each fishery. Upon commencement of a share management plan for each fishery, a number of management responses will be implemented. These typically relate to the establishment of effort controls, entry and transfer arrangements, and penalty point deterrents for serious or repeat offenders. At present, the concepts behind these responses are being worked through with industry.

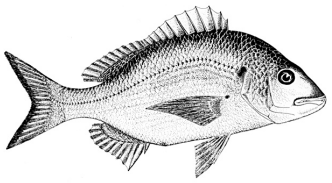
The implementation of new management actions involves a process of consultation with industry representatives and relevant advisory groups, consideration of cross-fishery issues and ongoing refinement in light of practical experience. As strategies are developed for other commercial fisheries a number of the responses outlined in specific strategies will be implemented as cross fishery programs. This will enable a more cost-effective approach to implementation, as well as ensuring that cross fishery and species based issues are dealt with in a consistent and appropriate manner.

Although many of the management actions have been introduced, a number of actions are still in the process of being implemented. This means that a number of the target timeframes included in the approved management strategies have not been met. In accordance with the terms of the management strategies, the implementation of these actions has been reviewed to determine whether any remedial action is warranted. The review has determined that no remedial action is warranted at this stage. Detailed information on the process of implementing actions is provided in Appendix 3 of this report.

Many other actions have commenced and significant progress has been made well in advance of their target timeframes. In particular, significant work has been done on improving fishing gear used in the Estuary Prawn Trawl Fishery prior to the June 2006 timeframe.



Yellowfin/Black Bream
– *Acanthopagrus australis/butcheri*



Summary

The Estuary General, Ocean Hauling and Ocean Trap and Line Fisheries harvest yellowfin bream in significant quantities. There is also a large recreational catch of yellowfin bream.

Commercial landings have been declining since 1993/94 but this trend has recently stabilised. The introduction of improved catch-return forms in 1997/98 (along with Restricted Fisheries) enabled a relationship to be established between catch and effort for the many methods used to harvest bream. Data from mesh-netting indicates that commercial catch rates are stable and indeed appear to have slightly increased in 2002/03.

This result is consistent with the age and length frequency distributions of bream that have also been stable during this period.

These data also include landings of black bream (from estuaries). This is a more complex management issue because of concerns about hybridisation between the two species.

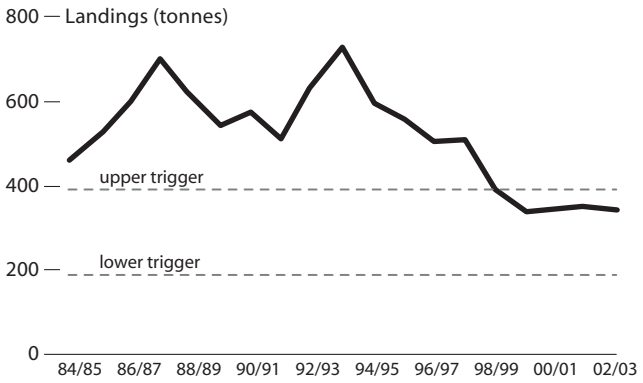
Trigger point summary

2002/03 Landings	– 333 t
Lower Trigger	– 195 t ✓
Upper Trigger	– 398 t ✓

Landings of Yellowfin/Black Bream in NSW

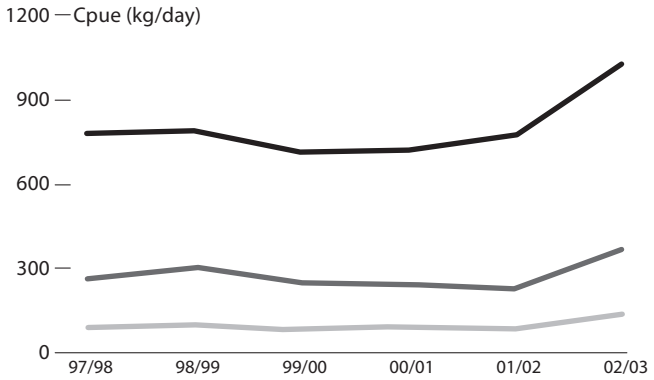
After a large decline from 1993/94, landings have been stable since 1999/00. This recent stability resulted in no trigger points being activated in 2002/03. Trigger points are calculated on the basis of a ***change*** in landings rather than the absolute value. This can result in the trigger values being outside the range of historical landings.

See text on page 3 of this report for a complete description of the indicators and trigger points.



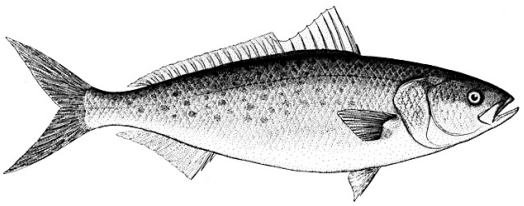
Catch Rates of Yellowfin/Black Bream in NSW (Mesh-Netting)

The upper, middle and lower quartiles of catch rates from mesh-netting have been steady since 1997/98, and slightly increased in 2002/03. This result is unsurprising because of the reductions in commercial harvests since 1997/98 (see above). This indicates that there are no immediate concerns with yellowfin bream stocks. There are, however, potential issues of hybridisation with black bream stocks.



Australian Salmon

– *Arripis trutta*



Summary

Australian salmon are primarily caught in haul nets in the Ocean Hauling Fishery in the south of the state. Landings are variable but have increased in recent years.

The large landings in 2002/03 that caused the activation of the upper trigger point are probably the result of larger and more numerous aggregations of fish as the catch rates of more successful fishers were also large. There is no evidence, however, that catch rates are correlated to either the size of schools or abundance of salmon.

This variability in landings and catch rates will make it difficult to identify changes in abundance from available data. Note that the large decline in landings from 1998/98 was soon followed by a rapid increase.

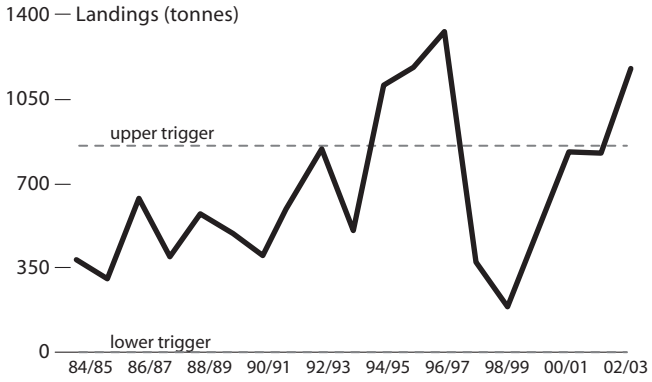
Trigger Point Summary

2002/03 Landings	– 1164 t
Lower Trigger	– 0 t ✓
Upper Trigger	– 838 ✗

Landings of Australian Salmon in NSW

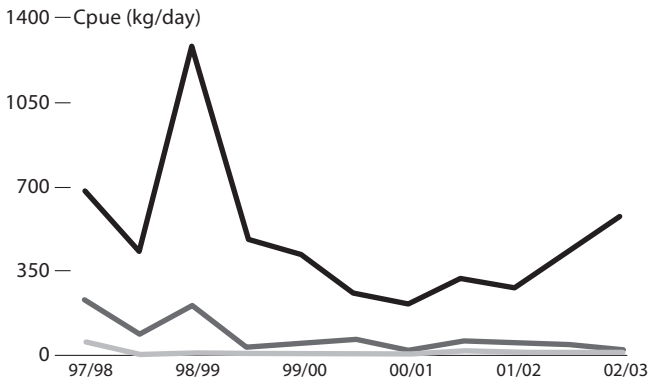
Landings of this species have been observed to fluctuate widely. After a large decline in 1998/99, landings have increased along with catch rates. This suggests that the stock is not being fished down. The aggregating behaviour of these fish means that catch rates must be cautiously interpreted.

See text on page 3 of this report for a complete description of the indicators and trigger points.



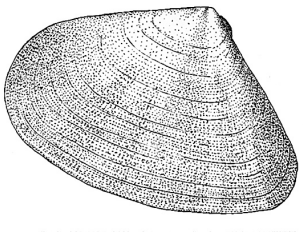
Catch Rates of Australian Salmon in NSW (Beach Hauling)

The upper, middle and lower quartiles of catch rates of this species are extremely variable. Availability of this species changes a great deal and this is possibly associated with changes in abundance. There is thus no immediate concern about the breach of the upper landings trigger point, but this stock will be carefully monitored.



Pipi

– *Plebidonax deltoide*



Summary

Pipis are a relatively valuable shellfish that are harvested by Estuary General fishers that have an endorsement for hand gathering.

Landings and catch rates have declined in recent years indicating that abundances on beaches open to gathering are significantly lower than when the fishery first developed. Due to food safety concerns there is no recreational fishery for pipis (except for bait).

The activation of the trigger point generated a more detailed examination of the pipi fishery. This examination indicated that there are a number of reasons for the decline in landings. In 2000/01, South Australia started harvesting pipis for human consumption for the first time.

This had a marked effect on demand for pipis from NSW and resulted in a reduction in landings.

Furthermore, since 2000/01 the harvesting of pipis in NSW has been managed under three bio-toxin management plans. This has altered the harvesting patterns and caused a reduction in landings and probably catch rates.

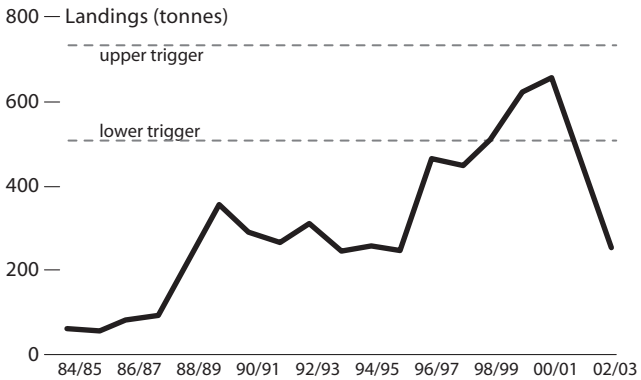
There is concern about the illegal harvest of pipis on some beaches in NSW.

Trigger Point Summary

2002/03 Landings	– 258 t
Lower Trigger	– 508 t ✗
Upper Trigger	– 735 t ✓

Catch Rates of Pipis in NSW (Hand Gathering)

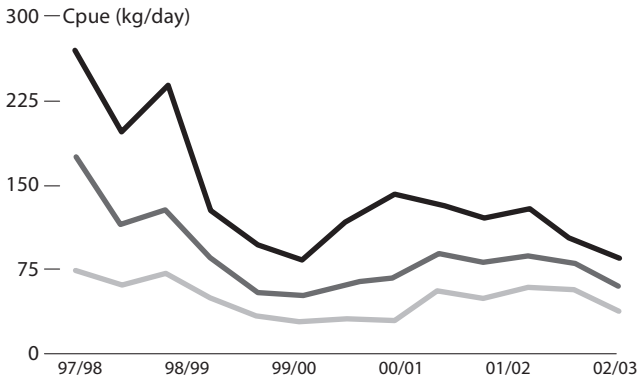
The upper, middle and lower quartiles of catch rates have declined since 2000/01. Hand gathering targets aggregations of pipis on beaches so consistent declines of catch rates are of concern. Changes to the management of pipis in 2000/01 are probably responsible for this decline in catch rates, though this situation will be closely monitored.



Landings of Pipis in NSW

After consistent increases since 1984/95, there has been a decline in landings since 2000/01. This caused an activation of the lower landings trigger point in 2002/03. Trigger points are calculated on the basis of a change in landings rather than the absolute value. This can result in the trigger values being outside the range of historical landings.

See text on page 3 of this report for a complete description of the indicators and trigger points.



FMS Performance Report 2004:
Trigger points relating to commercial landings

The purpose of these indicators and trigger points is to identify short term shifts in reported landings of species.

For the purpose of this table;

- **Catch** rates refers to the kilograms of fish caught per day of fishing.
- **EG** means Estuary General Fishery.
- **Landings** are reported commercial landings and does not include fish that are caught and returned (eg. if they are below the size limit).
- **OH** means Ocean Hauling Fishery.
- **Recreational fishing havens** are estuaries or areas within estuaries that are closed to some or all commercial fishing methods.

Species	Catch triggers (t) [Lower, Upper]	Landings (t) 2002/03	Status	Comment
Anchovy *OH – target species*	[17, 59]	8	✗	The lower trigger point has been activated, however there has been a history of high variation with respect to anchovy landings. Anchovy landings will be closely monitored in the next analysis to determine if this is leading to a longer term decline. Remedial action is not recommended at this stage
Australian salmon *OH – target species*	[0, 838]	1164	✗	The upper trigger point has been activated. There has been a large increase in both catch and catch rates for Australian salmon. Whilst a trip (catch) limit applies in the north of the State, fishers have reported an abundance of Australian salmon throughout the state. This appears to have lead to a significant increase in landings. Remedial action is not recommended at this stage
Beachworm *EG – key secondary species*	[5, 34]	15	✓	
Blue mackerel *OH – target species*	[290, 803]	511	✓	
Blue swimmer/sand crab *EG – key secondary species*	[62, 199]	178	✓	
Bonito *OH – target species*	[128, 255]	88	✗	The lower trigger point has been activated, however there has been no overall declines in catch rate. Bonito is also a major target species of the Ocean Trap and Line Fishery and landings in that fishery would impact significantly on this indicator. This situation will be monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage
Cockle *EG – key secondary species*	[24, 78]	24	✓	
Common jack mackerel *OH – target species*	[0, 357]	1	✓	
Dart *OH - target species*	[11, 19]	6	✗	The lower trigger point has been activated, however the decline in catch rate has stabilised. This situation will be monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage

Species	Catch triggers (t) [Lower, Upper]	Landings (t) 2002/03	Status	Comment
Dusky flathead *EG – primary species*	[156, 193]	133	✗	The lower trigger point has been activated. This is most likely to be due to a combination of the establishment of recreational fishing havens, and the impacts of drought conditions. Importantly, the catch rate is stable. Remedial action is not recommended at this stage
Eastern king prawn *EG – primary species*	[887, 1246]	1009	✓	
Fantail mullet *EG - key secondary species*	[65, 124]	52	✗	The lower trigger point has been activated. This is most likely to be due to a combination of the establishment of recreational fishing havens, and the impacts of drought conditions. Remedial action is not recommended at this stage
Greasyback prawn *EG - key secondary species*	[0, 50]	8	✓	
Luderick *EG – primary species* *OH – target species*	[387, 593]	417	✓	
Mud crab *EG – primary species*	[88, 168]	134	✓	
Mulloway *EG – key secondary species*	[35, 95]	61	✓	
Pilchard *OH – target species*	[0, 198]	251	✗	The upper trigger point has been breached, however the historical catches of pilchard have been highly variable. There have been recent changes to pilchard fishing activities in that the species is now being targeted, and the landings will be closely monitored during the next analysis to determine if there are any concerning trends. There has also been a possible recovery of the species following significant pilchard kills in the late 1990's/ Remedial action is not recommended at this stage
Pipi *EG – primary species*	[508, 735]	258	✗	The lower trigger point has been breached, and both landings and catch rates are declining in this fishery. There have been a number of changes that have influenced pipi harvesting over the past years, and these are mentioned in the pipi summary in appendix 1. Remedial action is not recommended at this stage
River eel (longfinned/ shortfinned) *EG – primary species*	[121, 250]	102	✗	The lower trigger point has been breached. This is most likely to be due to a combination of the establishment of recreational fishing havens, and the impacts of drought conditions. The landings will be closely monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage
River garfish *EG – key secondary species*	[24, 49]	17	✗	The lower trigger point has been breached. This is most likely to be due to a combination of the establishment of recreational fishing havens, and the impacts of drought conditions. Landings have declined but this corresponds with decrease in effort. No declines in catch rates have occurred. Remedial action is not recommended at this stage
Sand whiting *EG – primary species* *OH – target species*	[90, 167]	145	✓	
Sandy sprat, whitebait and glassfish *OH – target species*	[36, 116]	59	✓	
School prawn *EG – primary species*	[768, 1515]	487	✗	The lower trigger points has been breached. This is most likely to be due to a combination of the impacts of drought conditions as well as the establishment of recreational fishing havens. Landings of school prawns are highly variable, and in particular are linked to levels of rainfall. No obvious declines in the catch rate are occurring. Remedial action is not recommended at this stage
Sea garfish *OH – target species*	[0, 129]	21	✓	

Species	Catch triggers (t) [Lower, Upper]	Landings (t) 2002/03	Status	Comment
Sea mullet *EG – primary species* *OH – target species*	[1391, 3435]	2739	✓	
Silver biddy *EG – key secondary species*	[88, 175]	72	✗	The lower trigger point has been breached. This is most likely to be due to the establishment of recreational fishing havens, in particular in Lake Macquarie. There has also been a decline in catch rates of silver biddy. The landings will be closely monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage
Silver trevally *OH – target species*	[26, 576]	292	✓	
Sweep *OH – target species*	[0, 98]	32	✓	
Trumpeter whiting *EG – key secondary species*	[47, 79]	33	✗	The lower trigger points has been breached. This is most likely to be due to the establishment of recreational fishing havens. There has also been a decline in catch rates of trumpeter whiting. Landings will be closely monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage
Yellowfin/black bream *EG – primary species* *OH – target species*	[180, 383]	333	✓	
Yellowtail scad *OH – target species*	[395, 551]	360	✗	The lower trigger point has been activated. This situation will be monitored during the next analysis to determine if there are any concerning trends. Remedial action is not recommended at this stage

FMS Performance Report 2004:

Trigger points relating to catch per unit effort (CPUE) for the Estuary Prawn Trawl Fishery

The purpose of these indicators and trigger points is to identify short term shifts in catch rates of the target species .

Target Species *Estuary*	Catch triggers (kg/day) [Lower, Upper]	CPUE (kg/day) 2002/03	Status	Comment
Eastern King Prawn				
Hunter River	[8, 66]	9	✓	
Hawkesbury River	[6, 17]	9	✓	
Port Jackson	[0, 9]	5	✓	
School Prawn				
Clarence River	[40, 77]	45	✓	
Hunter River	[26, 44]	31	✓	
Hawkesbury River	[14, 30]	19	✓	
Squid				
Hawkesbury River	[14, 18]	17	✓	

FMS Performance Report 2004:

Trigger points relating to the commercial landings of Ocean Hauling Fishery target species by gear type

The purpose of these indicators and trigger points is to identify changes in targeting of species by gear type

Performance indicator	Total landings (t) 2002/03	% of landings from target species	Status	Comments
That 95% of catch taken in General purpose hauling net (beach haul) is comprised of target species	2012.9	98	✓	
That 95% of catch taken in Purse seine net is comprised of target species	1471.4	99	✓	
That 95% of catch taken in Pilchard, anchovy and bait net is comprised of target species	354.9	98	✓	
That 95% of catch taken in Garfish hauling net is comprised of target species	11.8	89	✗	Significant quantities of pilchard, bonito and leadenall were recorded as being taken in the garfish hauling net. Whilst there is always expected to be varying levels of species other than garfish landed by this method, investigations are being carried out to ensure that there is no illegal use of this net, and to identify if there is likely to have been any misreporting.
That 95% of catch taken in species Garfish bullringing net is comprised of target	4.9	100	✓	

FMS Performance Report 2004:

Trigger points relating to the commercial landings of eels by catchment in the Estuary General Fishery

The purpose of these indicators and trigger points is to identify changes in landings of eels taken in the catchments that produce more than 10% of total eel landings

Catchment	Catch triggers (t) [Lower, Upper]	Landings (t) 2002/03	Status	Comments
Clarence River	[14.1, 42.3]	21.5	✓	
Myall Lakes / Port Stephens	[10.6, 32]	13.3	✓	
Richmond River	[7.8, 23.4]	10.6	✓	

Note: The intent of this indicator is to monitor only those catchments that produce the majority of eel landings (i.e. greater than 10%). Catchments that produce smaller landings have a much higher natural variation and may not be good indicators of the status of eel stocks.

FMS Performance Report 2004:
Trigger points relating to compliance and administrative matters

In addition to the species based trigger points, fishery management strategies include a number of performance indicators related to compliance, economics and management of fisheries.

Performance indicators	Trigger point/s	Status	Comments
Rates of compliance for the Estuary General, Ocean Hauling and Estuary Prawn Trawl Fisheries	EG – 80% compliance OH – 85% compliance EPT – 85% compliance	EG – ✓ OH – ✓ EPT – ✓	EG – 91% compliance OH – 96% compliance EPT – 87% compliance
Response of the Estuary General Fishery, Ocean Hauling Fishery or Estuary Prawn Trawl Fishery to marine pest and disease incursions	The Director, NSW Fisheries, determines that a fishery has not responded appropriately to marine pest and disease management programs that recommend that estuary general fishing be modified	EG – ✓ OH – ✓ EPT – ✓	
Response of the Estuary General, Ocean Hauling or Estuary Prawn Trawl Fisheries to threatened species declarations	Threatened species recovery plan or threat abatement plan requires modification to a fishery which the Director, NSW Fisheries considers is not adequately provided for in the relevant management strategy	EG – ✓ OH – ✓ EPT – ✓	
Number of Estuary General, Ocean Hauling or Estuary Prawn Trawl MAC meetings held each year	Less than two meetings for each fishery held in a calendar year, unless otherwise agreed by the MAC	EG – ✓ OH – ✓ EPT – ✓	
Occasions when the Director, NSW Fisheries, determines that the Estuary General, Ocean Hauling, or Estuary Prawn Trawl Fishery Management Strategy is in direct conflict with other approved Commonwealth and State programs	Any occasion when the Director, NSW Fisheries determines that this management strategy is inconsistent with other approved Commonwealth and State programs	EG – ✓ OH – ✓ EPT – ✓	
Area of beach totally closed to commercial ocean hauling fishing (through fishing closures, marine parks and/or aquatic reserves	The area open to beach hauling increases after the commencement of the Ocean Hauling Fishery Management Strategy	OH – ✓	
Performance of NSW Fisheries meeting needs of the Ocean Hauling MAC as per the Commercial Fisheries MAC Procedures Manual	NSW Fisheries fails to meet guidelines in 20% of communications with MAC	OH – ✓	

Implementation of management actions

This table presents information about the implementation of management actions outlined in the approved fishery management strategies for the Estuary General, Ocean Hauling and Estuary Prawn Trawl fisheries.

In this table, the following abbreviations have been used:

EG – Estuary General

OH – Ocean Hauling

EPT – Estuary Prawn Trawl

MAC – Management Advisory Committee

FMS – Fishery Management Strategy

DPI – NSW Department of Primary Industries

Note: the date(s) that appear after each action are the scheduled dates from the relevant FMS

Action	Status
Ban the use of fish spikes and clubs in the EG and EPT fisheries (by December 2002 [EG] and by December 2003 [EPT])	Implemented
Reduce the maximum length of fish hauling nets in the EG fishery to 500m, and restrict to one shot per day (by December 2002)	Implemented
Phase out the setting of mesh nets in the EG fishery with a mesh size less than 95mm between sunset and sunrise over winter (by November 2003)	Commenced in 2003 and consultation with industry is nearing finalisation. A regulation amendment is being prepared to implement this action
Increase the minimum mesh size of EG fishery flathead nets from 70mm (by November 2003)	A regulation is being drafted to increase the mesh size of flathead nets to 80mm. Additional refinement of flathead net arrangements is occurring in consultation with industry with regard to season length and bycatch provisions
Remove the concession to use 25mm mesh in the garfish hauling net in the OH fishery (from December 2002)	Implemented
Limit the estuaries & gear types to those outlined in the EG FMS (by December 2002)	Implemented
Implement a zoning scheme into the EG fishery to limit the regions in which fishers may operate (by December 2002).	Implemented
Limit the species able to be taken by each net type in the OH fishery to those prescribed in the FMS (by July 2003)	Implemented
Prohibit the use of hauling nets in the OH fishery over areas of Posidonia seagrass (by July 2004)	Implemented through regulation
Prohibit the use of hauling nets in the EG fishery over beds of Posidonia seagrass (by December 2002)	Implemented through regulation. Further refinement of the prohibition is currently underway to define the individual beds
Prohibit the use of estuary prawn trawlers over beds of Zostera and Posidonia seagrasses (Ongoing)	Implemented through regulation . Maps being developed through the estuarine mapping project will be used to further refine arrangements

Action	Status
Identify designated landing sites for fish hauling nets used in the EG fishery where seagrass exists around shoreline areas (by July 2003 and ongoing)	Commenced in 2003 through the estuarine mapping process
Identify areas of seagrass which should be closed to prawn hauling and prawn seining methods in the EG fishery (by December 2003)	A number of areas have been identified, and closures will be implemented following the estuarine mapping process. Additional areas may be identified and subsequently closed in the future as mapping continues
Ban the discarding of cooked prawns in the EG and EPT fisheries, and investigate the sustainability of grading uncooked prawns (Ban by December 2002 [EG] and July 2003 [EPT], and investigation complete by April 2005)	Ban on discarding cooked prawns implemented. Grading of uncooked prawns to be investigated
Implement incidental catch ratios and maximum counts on prawns taken in each estuary used in the EPT fishery (by December 2003)	Implementation commenced in 2003. A phased approach is being applied, with ratios in place for the Clarence River, currently in the process of being regulated for the Hunter and Hawkesbury Rivers, and further work with industry to establish appropriate ratios for Port Jackson. A higher priority is being placed on the development of new gear to reduce incidental catches in the EPT fishery (see below)
Introduce alternate fishing gears into the EPT fishery to minimise the capture of by-product species of non marketable quality (by June 2003 for squid & June 2006 for prawns)	Squid: A study was done by the University of Sydney to investigate the feasibility of changing current fishing gear used to target squid. DPI is working with local fishers to develop arrangements to implement improved by-catch reduction devices. At this stage, the mesh size of the gear that is currently used will not be changed Prawns: Work has commenced on an appropriate net for small prawns. Square mesh cod-ends were introduced in 2003 on a trial basis only in Clarence River, and experiments into the selectivity of different mesh sizes in cod-ends is being carried out
Prevent trawling in areas and at times of high abundance of incidental species (by December 2003)	This action is being implemented in conjunction with incidental catch ratios
Implement the use of discard chutes into the EG fishery (by July 2003)	Implemented
Introduce a scientific observer program into the EG, OH and EPT fisheries to collect data on bycatch for methods where little or no information is known (EG - December 2003, OH - from 2003, EPT - by July 2004 and ongoing)	The program is being introduced on a cross-fishery basis. A regulation was introduced to allow for the collection of fees from industry to fund the program. A framework for setting priorities is being developed, and the option of out-sourcing selected tasks is currently being worked through with industry
Review on an annual basis in consultation with the OH MAC the established code of practice for the beach-based sector of the fishery (annually)	Done through the MAC process each year, or as required throughout each year
EG MAC to provide advice to DPI regarding priority issues for habitat rehabilitation and conservation (annually)	This is being done through the MAC process
EG MAC to provide advice to DPI regarding habitat rehabilitation and research applications to ensure they provide a benefit for the fishery (annually)	This is being done through the MAC process
EGMAC to provide advice to DPI regarding mapping of key habitat areas that require rehabilitation (2002 and reviewed every 5 years)	This is being done through the MAC process on an ongoing / as needed basis
Develop a code of practice in consultation with the OHMAC for the boat-based sector of the fishery (by December 2003)	Code of practice developed
Develop a code of practice for the EG and EPT fisheries (by December 2003)	Implemented. Oceanwatch have developed these codes of practice under a grant received from the Fisheries Research and Development Corporation

Action	Status
Restrict the engine power of vessels in the EPT fishery in Port Jackson (by July 2003)	Implemented
Limit the size and dimensions of gear permitted to be used in the OH fishery to the specifications provided in the OH FMS (by July 2003)	Implemented
Develop an objective system for defining and setting trigger points to detect concerning trends in landings of all species permitted to be taken in the EG fishery (annually from 2003)	A number of systems have been investigated, and various trend detecting algorithms have been developed and published. Appropriate algorithms and changes to trigger points are being phased in from 2003
Develop stock assessments of target species within five years and ensure the assessments are reviewed every three years thereafter (EG & OH - from 2003)	Commenced in 2003
Monitor quantity, length, and/or age and sex composition of target and by-product species caught in the EPT fishery (by July 2002 and then ongoing)	This monitoring will be included in the scientific observer program
Ascertain the need for a legal minimum length for squid and implement as required (by June 2004)	After consultation with the EPTMAC, a size limit will not be implemented for squid at this stage. This is in part due to the high level of mortality of squid when caught. Attention will instead be focussed on refining squid gear
Together with all harvest sectors of squid in NSW, review the exploitation status of the squid resources (EPT - by December 2003, and then as required)	A study into the growth and mortality of squid has been done as part of a PhD thesis through University of Sydney. The final report is currently in preparation and will be used to determine how the review should occur
Review, and where appropriate implement minimum legal lengths for primary finfish species in the EG fishery to give a high probability that at least 50% of the fish of each species landed have reached reproductive maturity, and consider the need for minimum legal lengths for key secondary and primary species in the EG fishery (timeframes yet to be determined)	These issues will be taken into account during the state-wide review of size limits currently underway. The review will be subject to a process of public consultation, including specific consultation with the commercial and recreational fishing advisory groups
Commence consultation with all harvest sectors of silver trevally over the development of a recovery program for that species, in particular consider the introduction of an appropriate size limit to address growth overfishing (immediate)	Consultation has commenced, and this issue is being addressed during the preparation of the FMS for the Ocean Trawling Fishery. The review into size limits will also consider the silver trevally
Finalise the current review of eel harvesting in the EG fishery and implement the outcomes (by December 2002)	The review has been finalised and comments have been obtained from eel fishers. Consultation has occurred with the EGMAC, and a regulation amendment to increase the minimum legal length of eels from 30 cm to 58 cm, and to clarify the wording of the description of eel traps is being prepared
Prevent the taking of sea garfish in the EG fishery whilst a recovery program for the species is being developed (by December 2002)	Implemented through fishing closure. Further refinements are being developed in consultation with industry
Monitor the impact of the zoning of boat-based garfish hauling on the harvest of the sea garfish stock (from December 2002)	Data has been obtained and will be discussed with OHMAC during 2004
Extend the November-February weekend closure for garfish hauling to a year-round weekend closure in the OH fishery (from December 2002)	Implemented
Describe the retention and rate of meshing by size for sea garfish in 28mm mesh and test appropriate larger mesh sizes in OH garfish hauling nets (by July 2003)	Implemented
Consult with the EG MAC and OH MAC regarding removing the method of garfish hauling from the EG fishery, and remove the method of garfish bullringing from the OH fishery (by July 2004)	Consultation has occurred with both MACs. At this stage, the method of bullringing has been removed from the OH fishery, whilst the method of garfish hauling remains in the EG fishery

Action	Status
Implement the approved recommendations of the fish and crab trapping review in the EG fishery (by July 2003)	The approved outcome of the review was to continue the current arrangements, and to clarify the rules through regulation amendment
Implement an owner/operator rule for fishing businesses in the EG fishery, except in cases of short term illness (by December 2003)	Implemented
Implement restrictions on the renewal of OH endorsements for the non-payment of annual fees (by July 2004)	Implemented
Develop and implement a policy to manage the harvest of bait for the Commonwealth Tuna Fishery in NSW waters (various timeframes)	A restricted fishery is being created and permit numbers have been capped. A code of conduct is in place for operators, and a reporting system has been developed
Develop and implement a policy to manage the use of a lift net for collection of bait by NSW line fishers (various timeframes)	This policy is being developed in consultation with the Ocean Trap and Line MAC, and the tuna component will be managed through the establishment of the Tuna Bait Fishery
Use the Total Allowable Catch Setting and Review Committee to make determinations relating to the maximum level of effort that may be applied to prawn stocks through the EG and EPT FMSs (from 2003)	The department conducted a preliminary workshop with the TAC Committee to discuss the approach and the types of information available / needed to develop and implement this system. A study funded by an Australian Research Council linkage grant over three years is looking at prawn stock assessment and evaluation of management strategies for prawns. This will be used to inform the best approach for management by effort controls
Develop a nomination policy for all sectors of the OH fishery (by July 2004)	A transfer and nomination policy is currently in place, and will be reflected in the share management plan for the fishery
Develop an index of relative fishing power between OH boat-based and beach-based hauling (for methods that are common to both) and introduce appropriate management controls based on the differences in fishing power (by July 2004)	An indicative index has been developed in consultation with OH MAC. Further refinement of the index would require additional data. This data could only be sourced through implementing daily logbooks, which may not be feasible considering the increase in administration required
Establish minimum entry requirements for new entrants into the OH fishery at the fishing business level (i.e. taking into account entitlements held in other fisheries) to prevent increases in effort by small businesses (by December 2003)	There is currently a transfer and nomination policy in place for all sectors of the OH fishery. The share management plan for the OH fishery will include controls on new entrants to the fishery
Monitor the annual reported landings of prawn and squid species that are also taken in the EG and Ocean Trawl fisheries (EPT - by July 2003 and then annually)	This is done on an annual basis through the performance reporting process, including the use of trigger points for species landings and cross fishery interactions
Estimate, the size of non-commercial catch, and the relative impact of this on resources harvested in the EG fishery (by June 2003)	This is being done through the stock assessment process
Estimate, the size of non-commercial catch and catch by indigenous peoples, and the relative impact of this on resources harvested in the EPT fishery (by June 2006)	This is being done through the stock assessment process
Modify the reporting system, in consultation with the MACs, to collect information on sightings and captures of threatened or protected species using catch returns (EG & OH - by December 2002, EPT - by July 2003)	Reporting has been modified and fishers have been advised of the requirements. New catch reporting forms that include a specific field for threatened and protected species interactions will be produced upon replacement of current stocks. In addition, a photo identification chart is being produced to assist fishers in identifying threatened and protected species. Interactions with all threatened species and sightings of marine protected species are being recorded
Limit the annual landings of by-product species within each estuary in the EPT fishery to species & quantities listed in the EPT FMS (by June 2003 and then ongoing)	Commenced in January 2003
Through cross fishery stakeholder consultation, determine an appropriate size at first capture for king & school prawn species (EG fishery - as required from 2003)	Consultation has commenced with advisory groups on how this may be implemented, and how it could relate to other controls

Action	Status
Implement closures to estuarine prawn trawling on weekends and public holidays across all estuaries used in the EPT fishery (Immediate upon commencement of the EPT strategy)	Implemented
NSW Fisheries will develop, in consultation with OHMAC, a system to provide for new additions to the lists of target species for each of the ocean hauling methods, and proposed changes to methods (by December 2003)	Consultation has commenced with OHMAC. A draft policy has been developed, and further work will be done with industry on finalising the approach. Implications of changes on Commonwealth export approvals is being investigated
Continue to use fishing closures to control the area and time fished in the OH fishery to equitably share the resource through the regional liaison process (by July 2004)	Implemented. Additional areas that may be closed as a result of the regional liaison process have been identified, and further consultation with industry is to occur
NSW Fisheries will develop, in consultation with the Advisory Council on Commercial Fishing, a cost recovery framework (EG, OH & EPT - November 2005)	Work on the framework has commenced, and consultation is being undertaken with industry representatives, including the Seafood Industry Advisory Forum
Monitor, in consultation with OHMAC, access restrictions from other jurisdictions (annual review)	This matter is a standing agenda item for OHMAC meetings, and is discussed with the MAC on numerous occasions throughout each year
Determine a size at first capture for eastern king & school prawns and appropriate counts for each target species of prawns (by July 2007)	This is being done through the introduction of prawn counts into each estuary used in the EPT fishery
Develop in consultation with EGMAC, compliance strategic plan to direct education, advisory and enforcement services provided by NSWF for EG fishery (by December 2002)	Implemented
Develop, implement & monitor, with EPTMAC, a compliance audit scheme and operational plans for each estuary and encourage voluntary compliance through educational programs (by December 2003 and ongoing)	Compliance plans and audit scheme developed for the Hunter River, plans being developed for other estuaries. Additionally, there is an overall state-wide compliance plan in place
Design & implement with EG and OPT fisheries an industry funded program to conduct fishery independent surveys of the school and eastern king prawn and squid resources of the EPT fishery (pilot study 2003-04, and full scale July 2006)	Independent survey information from the estuarine finfish and shellfish Fisheries Research and Development Corporation program will be used to determine whether proceeding with additional surveys would be cost effective
Monitor all species and quantity of catches taken by each net type (and where appropriate, within each region) used in the OH fishery (annual review)	These species and quantities are being monitored through the annual review of performance indicators
Develop and implement an education strategy for OH fishers and NSW Fisheries contact officers (by July 2003)	Implemented
Provide a means by which ocean hauling fishers can report fish observed but not caught (by July 2003)	Implemented. Fishers have been advised that they can use the 'comments' section on the catch returns until new forms are developed. Additional work needs to be done to consider the benefits of ongoing use of this data

(Footnotes)

[1] The trigger points for species landings were set at conservative levels such that approximately 80% of landings fall within the acceptable range, and 20% would be expected to trigger a review.