



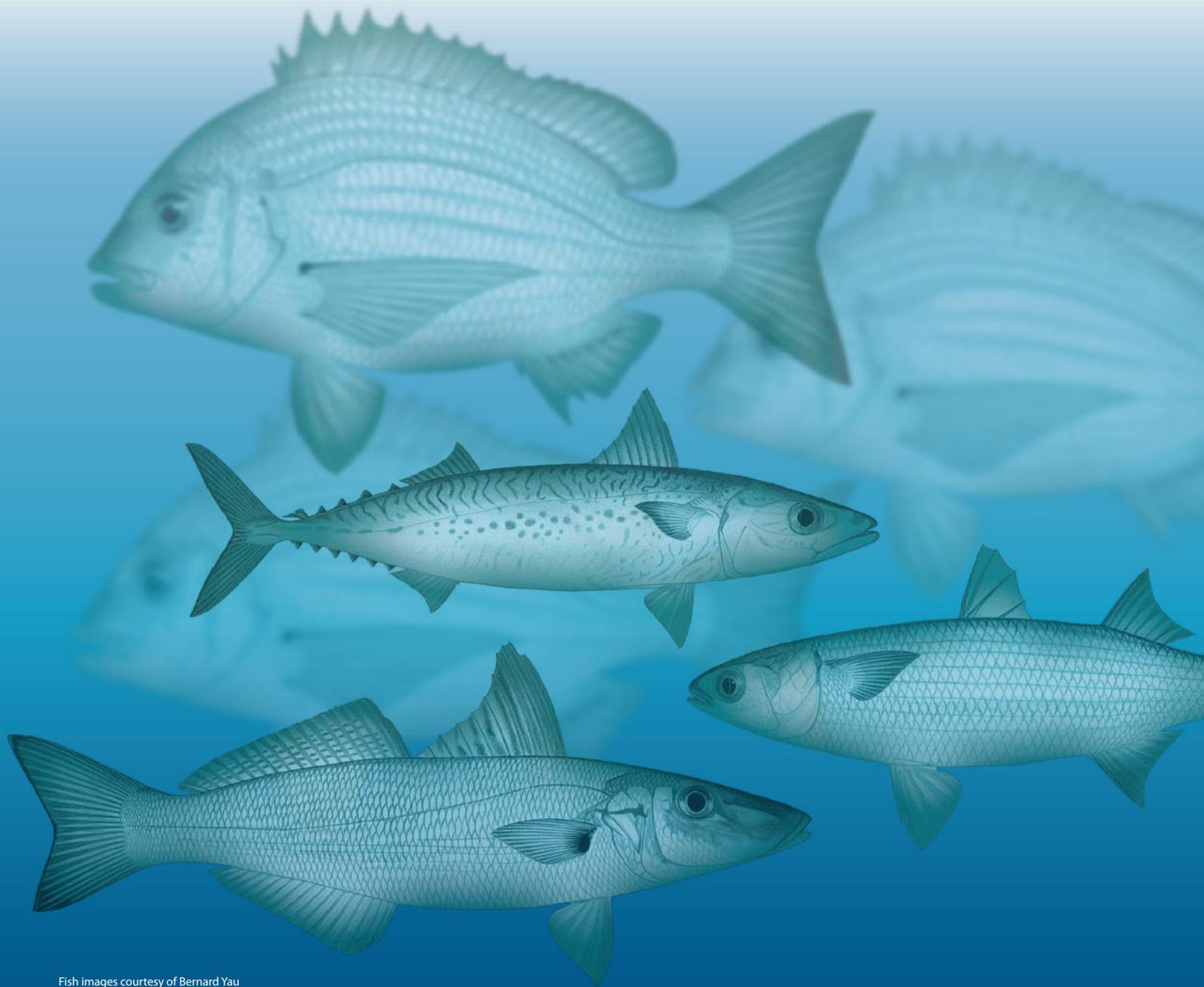
**Industry &  
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# Status of **Fisheries** **Resources** in NSW 2008/09



# STATUS OF FISHERIES RESOURCES IN NSW 2008/09

## INDUSTRY & INVESTMENT NSW

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## Foreword by the Minister

I am pleased to introduce the "Status of Fisheries Resources in NSW 2008/09". This report updates the status of all species initially assessed in 2006/07, and includes a number of additional species which are significant to the marine commercial and recreational fisheries of NSW.

This document and its web-based publication mark an important component of the reporting requirements for the Fishery Management Strategies of NSW's commercial fisheries. It provides a method to ensure that one of the key goals in these strategies is met – "to maintain stocks of key species harvested by the fishery". I am pleased to advise that the NSW Government and Industry & Investment NSW (I & I NSW) are committed to conducting and publishing these resource assessments for key species on a regular basis. The report also supplements the I & I NSW Annual Report by providing a detailed summary of the available catch and biological information for each important species.

The NSW Government is committed to better research and management of our aquatic resources, which are owned by the whole community. We must ensure that our resources are managed in a sustainable way for the benefit of current and future generations. Assessments contained in this report detail our understanding of the status of these resources and highlight where further research may be required.

The information presented is used by I & I NSW to assess and report on the status of the State's wild fisheries resources. The information is updated and reviewed on an annual basis, and a detailed summary report is produced biennially. This ongoing series therefore provides an important mechanism that the public can use to evaluate the continued success of our fisheries management initiatives here in New South Wales.



**STEVE WHAN**  
**Minister for Primary Industries**  
**Minister for Emergency Services**  
**Minister for Rural Affairs**



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# Executive Summary

The Status of Fisheries Resources report provides an overview of the state of marine and estuarine fish populations that are harvested by commercial and recreational fisheries managed by the NSW Government. In particular, the 2008/09 report contains a two to four page summary on the state of knowledge of 108 fish and invertebrate species (or species groups) caught by commercial and recreational fishers. Note that this report does not include any commentary on freshwater species caught by commercial or recreational fishers.

This report is published every two years to meet public reporting requirements for the Estuary General, Estuary Prawn Trawl, Ocean Hauling, Ocean Trawl and Ocean Trap & Line fisheries. The last version of the report (Status of Fisheries Resources 2006/07) was released in 2008.

Status for each species is assessed at an annual meeting of fisheries scientists and managers from NSW, after consideration of all available relevant information for the species. Fisheries scientists from adjoining jurisdictions or with expertise in a particular species are also invited to attend the meeting.

## **Species assessed as 'Overfished' or 'Recruitment Overfished'**

The number of species assessed as 'overfished' or 'recruitment overfished' increased from 3 in the last Status Report (for 2006/07) to 6 in the current report (for 2008/09). This change reflects both an increase in the number of species considered since the last Status Report (up from 92 to 108), and changes in the status of particular species.

Since the last Status Report in 2006/07, one species (jackass morwong) was added to the 'overfished' category because of an assessment done by the Commonwealth fisheries agency. The majority of the catch of jackass morwong, and another species assessed as 'recruitment overfished' (eastern gemfish) is taken by Commonwealth-managed fisheries. Stock rebuilding for these species will depend on initiatives taken under the Commonwealth jurisdiction.

For NSW-managed species, two species (eastern sea garfish and mulloway) continue to be assessed as 'overfished' since 2006/07, and 2 others (blacklip abalone and grey morwong) have been recently assessed as 'overfished'. These four species are currently subject to specific management initiatives aimed at addressing the issues which led to their assessment as 'overfished'. Blacklip abalone is a quota-managed species, and the total allowable catch has been reduced markedly to aid the recovery of the species; indications are that this species is beginning to recover. Recovery plans are currently being developed for eastern sea garfish and mulloway, in consultation with industry groups. When these two recovery plans are complete, a recovery plan will then be developed for grey morwong.

## **Species assessed as 'Growth Overfished'**

Since the last Status Report in 2006/07, one species (school prawns) was removed from the 'growth overfished' category (now considered 'fully fished'), and five species (redfish, silver trevally, snapper, yellowtail kingfish and eastern king prawn) continue to be considered 'growth overfished', where the average size at capture is smaller than the biological optimum. The status of these species will be kept under review following a number of management actions aimed at addressing their 'growth overfished' status.

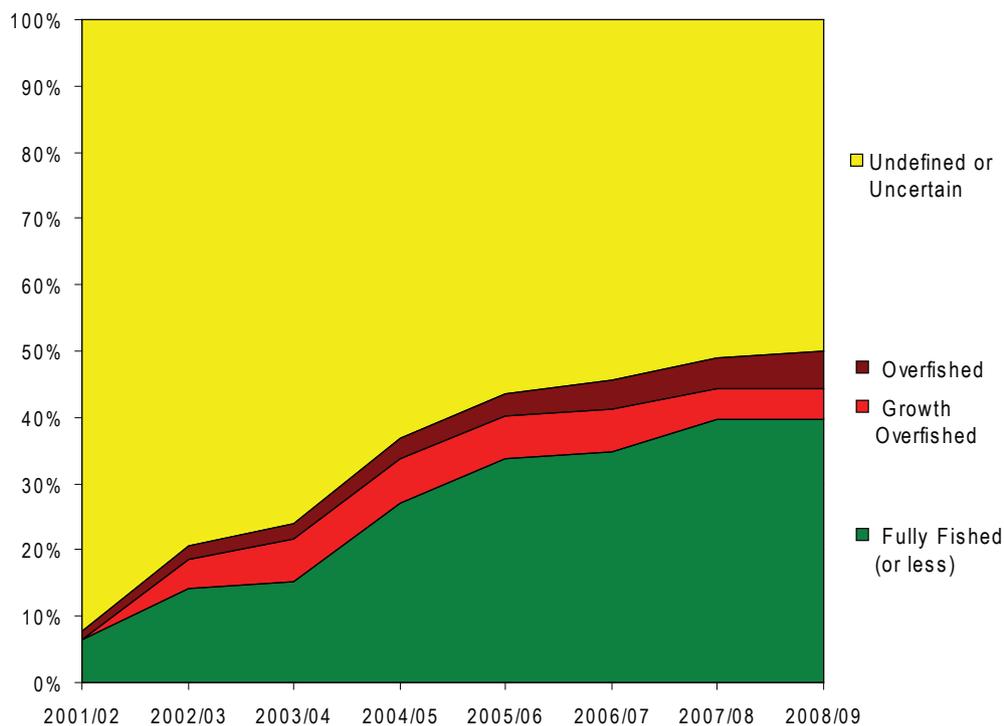
### Species assessed as 'Uncertain' or 'Undefined'

About 50% of the species that have had their status considered have been assessed as 'uncertain' or 'undefined'. This reflects the large number of species required to be assessed by this process (greater than 100), the limited resources available to do assessments, difficulties with the proper identification and correct reporting of many closely related and little studied species, and the ongoing need for detailed biological studies for many species.

Since the assessment process commenced nearly a decade ago there has been a very significant reduction in the proportion of species whose status has been assessed as 'uncertain' or 'undefined' – down from more than 80% to around 50%. This has been due to concentrated efforts by fisheries researchers at I&I NSW to improve our biological knowledge for a large number of important aquatic species. Also, in July 2009 more detailed catch-reporting requirements were introduced for NSW commercial fishers, and this is expected to lead to more accurate reporting of catches for some of the species currently assessed as 'undefined'.

The assessment of species as 'uncertain' or 'undefined' should not be interpreted to mean that these species may be under threat from overfishing, as many of these species are landed in very small quantities by commercial and recreational fisheries. Similarly, these species should not be considered as only 'lightly fished' until sufficient information is available to undertake a proper assessment. The information reviewed for each species during the status assessment process is used to prioritise future biological research, to ensure that the necessary research is directed at the most important species in the 'uncertain' and 'undefined' categories.

#### Exploitation Status of Species



**Summary of the exploitation status of species for commercial and recreational fisheries from 2001/02 to 2008/09. Note that some similar exploitation status categories have been combined to simplify the presentation in this graph.**

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Angel Sharks</a> <i>Squatina</i> spp.	Undefined	Species identification issues exist, and available data are insufficient to allow stock status to be determined for either species.	1
<a href="#">Australian Anchovy</a> <i>Engraulis australis</i>	Undefined	Very little information is available for this species, but it is likely to be a fast growing species with limited concerns for overfishing.	5
<a href="#">Australian Bonito</a> <i>Sarda australis</i>	Fully Fished	Relatively fast growing species that supports seasonally significant commercial and recreational catches.	9
<a href="#">Australian Sardine</a> <i>Sardinops sadax</i>	Fully Fished	Comparison of current annual yield with estimated biomass indicates a fully fished stock.	13
<a href="#">Banded Rockcod</a> <i>Epinephelus ergastularius</i>	Undefined	Small seasonal dropline fishery in NSW and recreational catches are thought to be increasing. Little information is available on the biology of the species.	17
<a href="#">Bass Groper</a> <i>Polyprion americanus</i>	Undefined	No detailed stock assessment available. Species has a worldwide distribution, local status has not been determined.	21
<a href="#">Beachworms</a> Onuphidae	Undefined	The catch comprises a mixture of species and there is insufficient information to assess the status of the stocks. No precise estimate of the recreational catch is available.	25
<a href="#">Bigeyes</a> Priacanthidae	Undefined	Taken as a bycatch in the Estuary Prawn Trawl and Ocean Trawl Fisheries and is also caught by the recreational sector. Little biological information is available.	29
<a href="#">Blacklip Abalone</a> <i>Haliotis rubra</i>	Overfished to Recruitment Overfished	Stock was significantly depleted by fishing during the 1980s and 1990s, and a series of increases in minimum legal length failed to produce any recovery in the stock. Abalone abundance in regions 1 and 2 has been further reduced by mortality due to parasite (Perkinsus) infection, and there are concerns that the stock is recruitment overfished in these regions.	31
<a href="#">Blue Mackerel</a> <i>Scomber australasicus</i>	Moderately Fished	Overall the stock off NSW is believed to be moderately fished, but there may be localised depletions.	35
<a href="#">Blue Swimmer Crab</a> <i>Portunus pelagicus</i>	Fully Fished	An important recreational and commercial species. Biological data collected for Wallis Lake indicate high fishing pressure in this estuary, with fishing mortality estimated to be greater than natural mortality.	39
<a href="#">Blue-eye Trevalla</a> <i>Hyperoglyphe antarctica</i>	Fully Fished	Mostly a Commonwealth fishery, where blue-eye is assessed as 'not overfished', but there are concerns about possible local depletion in some areas. Catch rates of NSW commercial fishers and the size composition of catches appear to be stable.	43

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Bluespotted Flathead</a> <i>Platycephalus caeruleopunctatus</i>	Fully Fished	A very important commercial and recreational species. Recent research has provided preliminary estimates of growth rates and size at maturity.	47
<a href="#">Boarfish</a> Pentacerotidae	Undefined	Three species are taken incidentally in the Ocean Trawl Fishery. Little biological information available for any of these species.	51
<a href="#">Broad Squid</a> <i>Uroteuthis etheridgei</i>	Fully Fished	The main fishery for this species occurs in the Hawkesbury River and is considered to be fully fished.	53
<a href="#">Brown Tiger Prawn</a> <i>Penaeus esculentus</i>	Undefined	NSW is at the southern end of the species range. Recruitment is likely to be small and variable.	57
<a href="#">Bugs</a> <i>Ibacus</i> spp.	Fully Fished	Four species of bugs are marketed in NSW; but two species dominate commercial landings and both these species are considered to be fully fished. The recreational catch is insignificant.	61
<a href="#">Catfish</a> Siluriformes	Undefined	Several species of catfishes are harvested at low levels in NSW estuaries by both commercial and recreational fishers. Very little information is available to establish exploitation status.	65
<a href="#">Cobia</a> <i>Rachycentron canadum</i>	Undefined	A minor fishery in NSW waters, but significant to recreational fishers. The stock is shared with Queensland where some biological research is underway. Very little useful information currently available from NSW catches.	69
<a href="#">Cockles</a> Arcoida and Veneroida	Undefined	No assessment is available for any of the cockle species harvested and reported within this group. Basic biological information is available for some species, but useful fishery data are lacking.	73
<a href="#">Common Jack Mackerel</a> <i>Trachurus declivis</i>	Uncertain	Predominantly a Commonwealth fishery with very few operators - Commonwealth status has been adopted.	77
<a href="#">Common Silverbidy</a> <i>Gerres subfasciatus</i>	Moderately Fished	There has been a reduction in commercial fishing pressure on this small estuarine species since the introduction of recreational fishing areas in 2002. Catch rates by haul netting are stable.	79
<a href="#">Crimsonbanded Wrasse</a> <i>Notolabrus gymnogenis</i>	Undefined	A significant recreational species with minor commercial landings. Some biological data are available, but fishery data are limited and have not been analysed in detail.	81
<a href="#">Cunjevoi</a> <i>Pyura stolonifera</i>	Lightly Fished	A sessile organism found in large abundance on rocky foreshores in high-energy intertidal surf zones. Harvested solely by recreational fishers for use as bait. A large proportion of the population occurs in habitats inaccessible to recreational fishers.	85
<a href="#">Cuttlefish</a> <i>Sepia</i> spp.	Uncertain	Species composition issues will restrict our ability to assess these stocks. All species in this group are likely to exhibit rapid growth and have a short life span.	87

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Dart</a> <i>Trachinotus</i> spp.	Undefined	No detailed stock assessment available. Mainly a recreational species, but there is little information about NSW catches.	91
<a href="#">Diamondfish</a> <i>Monodactylus argenteus</i>	Undefined	Mainly an estuary fish found around wharfs and rocky headlands. No detailed assessment likely to be completed.	93
<a href="#">Dogfish</a> Squaliformes	Undefined	Species identification issues are significant. One species, <i>Squalus megalops</i> , is still relatively abundant off NSW, but there are very serious conservation issues for all other dogfish species. Exploitation status to remain 'undefined' until better risk assessments are available.	95
<a href="#">Dusky Flathead</a> <i>Platycephalus fuscus</i>	Fully Fished	Commercial landings and catch rates are steady, but the species is primarily harvested by recreational fishers. Better catch information is required for the recreational fishery.	99
<a href="#">Eastern Australian Salmon</a> <i>Arripis trutta</i>	Fully Fished	Commercial landings are at historically high levels and the recreational catch is significant.	103
<a href="#">Eastern Blue Groper</a> <i>Achoerodus viridis</i>	Undefined	Stock was considered to be depleted in the 1960s and closures were introduced. Now a recreational line only species, and there is insufficient recent data to allow the current status to be specified.	107
<a href="#">Eastern King Prawn</a> <i>Melicertus plebejus</i>	Growth Overfished	Status continues to be growth overfished as determined by yield-per-recruit modelling, but this will be reviewed using recent data.	109
<a href="#">Eastern Pigfish</a> <i>Bodianus unimaculatus</i>	Fully Fished	The age composition of commercial landings suggests that fishing mortality is approximately the same as natural mortality.	113
<a href="#">Eastern Red Scorpionfish</a> <i>Scorpaena cardinalis</i>	Fully Fished	Fishing mortality appears to be similar to natural mortality. The species has a slow growth rate and considerable longevity.	117
<a href="#">Eastern Rock Lobster</a> <i>Sagmariasus verreauxi</i>	Fully Fished	Species has a long history of exploitation. The commercial fishery has been managed using Total Allowable Catch since the mid 1990s, is closely monitored, and has been relatively stable for the past decade.	121
<a href="#">Eastern School Whiting</a> <i>Sillago flindersi</i>	Fully Fished	A significant species in the NSW Ocean Trawl Fishery. The stock is shared with the Commonwealth and the status of fully fished is consistent with the Commonwealth assessment.	125
<a href="#">Eastern Sea Garfish</a> <i>Hyporhamphus australis</i>	Overfished	Despite some encouraging signs in the 2007/08 age composition, the stock does not appear to be recovering and there is still a lack of older fish (2-6 years) in the population.	129
<a href="#">Flounders</a> Paralichthyidae and Pleuronectidae	Undefined	Species identification issues need to be resolved before stock status can be assessed.	133

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Frigate Mackerel</a> <i>Auxis thazard</i>	Undefined	A small pelagic species with low and fluctuating commercial landings. Recreational catch may be significant. Minimal information currently available.	137
<a href="#">Gemfish</a> <i>Rexea solandri</i>	Recruitment Overfished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment has been adopted.	139
<a href="#">Ghost Nipper</a> <i>Trypaea australiensis</i>	Moderately Fished	A significant level of exploitation is estimated in some areas of the species' range, but the overall level of exploitation is likely to be low to moderate.	143
<a href="#">Ghostsharks</a> Chimaeriformes	Undefined	Small numbers of individuals are harvested as bycatch in the Ocean Trawl Fishery mainly from the outer continental shelf and continental slope. There is a lack of information with which to assess stock status.	145
<a href="#">Giant Mud Crab</a> <i>Scylla serrata</i>	Undefined	Significant commercial and recreational fisheries occur in NSW which is at the southernmost extent of the species' range. Local biological information has not been analysed in detail.	147
<a href="#">Goatfish</a> Mullidae	Undefined	Small quantities (20 - 40 t annually) taken incidentally in prawn and fish trawls. Assessment is constrained by lack of biological information.	151
<a href="#">Goldspot Mullet</a> <i>Liza argentea</i>	Moderately Fished	Exploitation rates vary between estuaries, but state-wide the species is considered to be moderately fished.	155
<a href="#">Greentail Prawn</a> <i>Metapenaeus bennettiae</i>	Undefined	The species is similar to school prawns, but lives entirely within estuarine waters. No detailed assessment of stock status has been made.	159
<a href="#">Grey Morwong</a> <i>Nemadactylus douglasii</i>	Overfished	Long term declines are evident in both landings and catch rates, and the average size of harvested fish has also decreased substantially since the 1970s. The age composition of landings strongly suggests that fishing mortality is greater than natural mortality.	163
<a href="#">Gummy Shark</a> <i>Mustelus antarcticus</i>	Fully Fished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment was adopted.	167
<a href="#">Hairtail and Frostfish</a> Trichiuridae	Undefined	No local biological information available for either species in this group, but growth and maturity have been studied for <i>Trichiurus lepturus</i> from the East China Sea, where it supports a major fishery.	171
<a href="#">Hammerhead Sharks</a> <i>Sphyrna</i> spp.	Undefined	Three species of hammerhead shark are harvested by the commercial line fishery and are also caught by the recreational gamefish fishery. Little information is available to specify exploitation status.	173
<a href="#">Hapuku</a> <i>Polyprion oxygeneios</i>	Undefined	No detailed stock assessment available. NSW landings of this species are very small compared to landings in New Zealand and by Commonwealth fisheries.	177

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Jackass Morwong</a> <i>Nemadactylus macropterus</i>	Overfished	The commercial harvest is predominantly by trawlers in the Commonwealth Southern and Eastern Scalefish and Shark Fishery. Commonwealth assessment is based on a full population model which shows a very significant decline in biomass since the 1980s. Recent biomass estimated to be about 20% of the unexploited level.	181
<a href="#">John Dory</a> <i>Zeus faber</i>	Fully Fished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment is 'uncertain' with respect to whether or not the stock is overfished. Given the long term relatively stable fishery in NSW, 'fully fished' is more appropriate for this jurisdiction.	185
<a href="#">Longtail Tuna</a> <i>Thunnus tonggol</i>	Undefined	A coastal tuna species for which the recreational fishery is probably more significant than the commercial fishery. There are few useful data with which to establish status.	189
<a href="#">Luderick</a> <i>Girella tricuspidata</i>	Fully Fished	A moderately long-lived species with significant recreational and commercial harvests. Fishing mortality rate is estimated to be about the same as natural mortality rate.	191
<a href="#">Mackerel Tuna</a> <i>Euthynnus affinis</i>	Undefined	Small commercial fishery with low priority for assessment. Possibly more significant in the recreational fishery. Minimal information available.	195
<a href="#">Mahi Mahi</a> <i>Coryphaena hippurus</i>	Undefined	Mainly targeted by recreational fishers, mahi mahi are likely to have high growth and mortality rates, but there is a lack of local information with which to assess stock status.	197
<a href="#">Mako Sharks</a> <i>Isurus</i> spp.	Undefined	Relatively small catches occur in NSW - the majority of the catch is the shortfin mako, which has a global distribution. Mako sharks are an important target species in the recreational gamefish fishery.	199
<a href="#">Mantis Shrimps</a> Stomatopoda	Undefined	Species identification issues need to be resolved. Very small quantities are landed and it is unlikely an exploitation status could be specified.	203
<a href="#">Mirror Dory</a> <i>Zenopsis nebulosus</i>	Fully Fished	Predominantly a Commonwealth fishery, with seasonal landings of mature fish by NSW trawlers north of Sydney during the winter months. Commonwealth status of "not overfished" is consistent with "fully fished", which is more appropriate for the NSW fishery.	205
<a href="#">Mulloway</a> <i>Argyrosomus japonicus</i>	Overfished	Age composition of samples from commercial catches was indicative of an overfished stock, and the spawning potential ratio was estimated to be below the recommended threshold.	209
<a href="#">Ocean Jacket</a> <i>Nelusetta ayraud</i>	Fully Fished	Stock abundance of ocean jackets appears to have increased significantly since 1999/2000. Status of all other leatherjacket species is undefined.	213

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Ocean Perch</a> <i>Helicolenus</i> spp.	Fully Fished	Two relatively long-lived species comprise the majority of the catch of this group. Significant in both the Ocean Trawl and Ocean Trap and Line Fisheries but most of the catch comes from the Commonwealth South East Trawl fishery. Status in NSW is consistent with the Commonwealth status of 'not overfished'.	217
<a href="#">Ocean Trawl Squid</a> Teuthida	Undefined	Status of Gould's or arrow squid ( <i>Nototodarus gouldi</i> ) has not been assessed in NSW. The main fishery is in Commonwealth waters - although a formal assessment has not been conducted the stock is considered to be 'not overfished' due to relatively low recent annual landings of this species which is considered to be an annual stock.	221
<a href="#">Octopus</a> <i>Octopus</i> spp.	Undefined	Lack of fishery information on the species harvested precludes resource assessment at this time.	225
<a href="#">Pearl Perch</a> <i>Glaucosoma scapulare</i>	Undefined	Pearl perch are predominantly harvested in Queensland. Biological research on this species has recently been completed in NSW, but results of current research in Queensland are needed before an exploitation status can be specified.	229
<a href="#">Pipi</a> <i>Donax deltoides</i>	Uncertain	Landings have declined markedly since 2005 and there is considerable concern amongst commercial fishers that catch rates have dropped to uneconomic levels, despite the reasonably high prices received. There is insufficient information to allow specification of an exploitation status.	233
<a href="#">Red Gurnard and Latchets</a> Triglidae	Undefined	Red gurnard is the primary species landed in NSW waters. There is little local information to assess status.	237
<a href="#">Red Morwong</a> <i>Cheilodactylus fuscus</i>	Undefined	Few data are available to assist in determining exploitation status. Very small by-catch from commercial trap fishing - the major harvesters are recreational spear fishers.	241
<a href="#">Redfish</a> <i>Centroberyx affinis</i>	Growth Overfished	Predominantly a Commonwealth fishery. The population is growth overfished and is very much depleted, but a full population model has not been successfully developed. The Commonwealth status has moved from 'Growth Overfished' to 'Uncertain', reflecting the lack of a good assessment of the extent of biomass depletion, but 'Growth Overfished' has been retained as it best describes the status of the stock in NSW.	243
<a href="#">River Eels</a> <i>Anguilla</i> spp.	Lightly to Fully Fished	Stock status varies between catchments, with some areas being lightly fished and other areas subject to significant fishing effort. Overall catch rate is relatively stable, with a decline in commercial fishing effort since the late 1990s.	247

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">River Garfish</a> <i>Hyporhamphus regularis ardelio</i>	Fully Fished	Study of catches from three estuaries suggested fishing mortality was approximately equal to natural mortality. Status may vary from estuary to estuary but, state-wide, the species should be considered to be fully fished.	251
<a href="#">Rock Blackfish</a> <i>Girella elevata</i>	Undefined	A coastal rocky foreshore species fished by recreational line and spear fishers. Almost no biological or fishery data are currently available for this species however a biological study is underway.	255
<a href="#">Royal Red Prawn</a> <i>Haliporoides sibogae</i>	Lightly Fished	The limited targeting of this species and the recent decline in landings is associated with the low market price received for this species.	257
<a href="#">Sand Mullet</a> <i>Myxus elongatus</i>	Undefined	This species has minor commercial and recreational importance. Biological data (growth rates and size at maturity) are available, but information on length or age composition of catches is lacking.	261
<a href="#">Sand Whiting</a> <i>Sillago ciliata</i>	Fully Fished	Sand whiting are targeted by recreational anglers and commercial fishers throughout their range. Commercial landings and catch rates are stable.	263
<a href="#">Sawsharks</a> <i>Pristiophorus spp.</i>	Undefined	Little information is available to assess stock status. Biological information from local populations should be collected.	267
<a href="#">School Prawn</a> <i>Metapenaeus macleayi</i>	Fully Fished	Research results and modelling have established that environmental factors (river flows) generally have a major influence on landings of school prawns (and in such cases a status of 'growth overfished' is not appropriate). Research is continuing on the optimum size at first capture.	271
<a href="#">Sea Mullet</a> <i>Mugil cephalus</i>	Fully Fished	A long history of stable landings and catch rates is evident for both the estuary and ocean fisheries.	275
<a href="#">Sea Urchins</a> Echinoidea	Undefined	A large amount of biological information is available for these three species, but there is insufficient useful monitoring data to allow exploitation status to be decided. Confusion over common names needs to be addressed.	279
<a href="#">Shovelnose Rays</a> Rajiformes	Undefined	Eastern shovelnose ray is by far the most significant species in the catch of this group – research underway should improve biological knowledge for this species.	283
<a href="#">Silver Sweep</a> <i>Scorpiis lineolata</i>	Fully Fished	A long lived species which may be susceptible to localised depletion. Fully fished in localised areas such as Wollongong but maybe moderately fished state-wide.	287
<a href="#">Silver Trevally</a> <i>Pseudocaranx dentex</i>	Growth Overfished	Minimum legal length (MLL) of 30 cm total length was implemented in September 2007 but recent size composition data indicate silver trevally should still be considered 'growth overfished'. Status should be reviewed after the impact of the MLL implementation has been fully assessed.	291

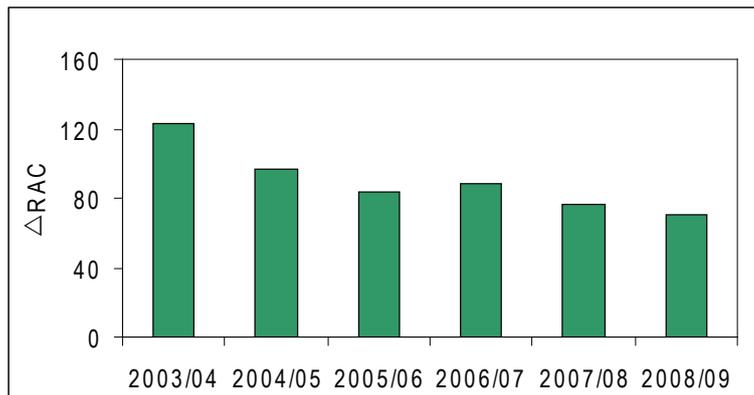
SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Snapper</a> <i>Pagrus auratus</i>	Growth Overfished	Commercial landings and catch rates have improved since the minimum legal length was increased in 2001, but recent analyses indicate the stock remains growth overfished.	295
<a href="#">Soles</a> Soleidae and Cynoglossidae	Undefined	Two species are significant in commercial catches, but little biological information and only limited size composition data are available.	299
<a href="#">Southern Calamari</a> <i>Sepioteuthis australis</i>	Undefined	Significant commercial and recreational landings. The biology of the species has not been studied in NSW, but in southern Australia calamari are known to be short-lived and fast growing.	303
<a href="#">Southern Maori Wrasse</a> <i>Ophthalmolepis lineolatus</i>	Moderately Fished	Mainly a recreational species, but also a small targeted commercial fishery. Fishing mortality is estimated to be about half the natural mortality rate.	307
<a href="#">Spanish Mackerel</a> <i>Scomberomorus commerson</i>	Fully Fished	Majority of the commercial harvest occurs in Queensland waters and status from the Queensland assessment has been adopted.	311
<a href="#">Spanner Crab</a> <i>Ranina ranina</i>	Fully Fished	Joint fishery-independent monitoring between NSW and Queensland occurs for this shared stock, and status has been determined from the Queensland assessment.	315
<a href="#">Spotted Mackerel</a> <i>Scomberomorus munroi</i>	Fully Fished	Predominantly harvested in Queensland, where assessment indicates that current recreational and commercial catch approximates the maximum sustainable yield. Status is consistent with the Queensland assessment.	319
<a href="#">Stout Whiting</a> <i>Sillago robusta</i>	Moderately Fished	A small, fast growing species caught by trawling in ocean waters. The stock is shared with Queensland and the status has been adopted from the Queensland assessment.	323
<a href="#">Striped Grunter</a> Terapontidae	Undefined	Striped grunter are small estuary/inshore fish caught as byproduct in estuarine and inshore ocean fisheries. Little biological information is available.	327
<a href="#">Striped Marlin</a> <i>Kajikia audax</i>	Undefined	Status will be adopted consistent with Commonwealth status which will result from the assessment of the south-west Pacific stock by the Scientific Committee of the Central and Western Pacific Fisheries Commission, currently nearing completion.	329
<a href="#">Tailor</a> <i>Pomatomus saltatrix</i>	Fully Fished	Significant recreational and commercial harvests in Queensland and NSW. Queensland assessment in 2004 indicated that the stock was close to the biomass at maximum sustainable yield (Bmsy) reference point.	333
<a href="#">Tarwhine</a> <i>Rhabdosargus sarba</i>	Fully Fished	The age composition of commercial landings indicates that fishing mortality is similar to natural mortality.	337
<a href="#">Teraglin</a> <i>Atractoscion aequidens</i>	Fully Fished	Commercial catch data suggest a long-term decline in this stock, although the species appears to be fairly quick growing and may be subject to large variations in recruitment strength. There is concern that the stock may actually be 'overfished' but that insufficient information is available to support this determination.	341

SPECIES	STATUS	HARVEST COMMENT	PAGE
<a href="#">Tiger Flathead</a> <i>Neoplatycephalus richardsoni</i>	Fully Fished	Predominantly a Commonwealth fishery, although significant landings are made by NSW trawlers north of Sydney. Exploitation status was adopted from the Commonwealth where a quantitative stock assessment has been developed.	345
<a href="#">Tiger Shark</a> <i>Galeocerdo cuvier</i>	Undefined	Tiger sharks are an important target species in the recreational club-based gamefish fishery. Commercial catches off NSW are likely to be smaller than recreational catches.	349
<a href="#">Tilefish</a> <i>Branchiostegus</i> spp.	Undefined	An incidental catch of fish trawling, tilefish apparently have a restricted distribution off NSW. Commercial landings and size composition data are available, and a biological study is underway.	351
<a href="#">Trumpeter Whiting</a> <i>Sillago maculata</i>	Undefined	Small commercial and recreational landings, mainly from a few estuaries. Biological studies of growth and maturity have recently been completed, but estimates of mortality rates from size and age composition data are lacking.	355
<a href="#">Turban Shells</a> <i>Turbo</i> spp.	Undefined	Very little information available to establish an exploitation status.	359
<a href="#">Whaler Sharks</a> <i>Carcharhinus</i> spp.	Undefined	A complex of species that are very difficult to identify (particularly as juveniles). Insufficient information is available to determine status for any of the whaler shark species.	361
<a href="#">Whitebait - Sandy Sprat</a> <i>Hyperlophus vittatus</i>	Undefined	Commercial landings average about 100 t per annum and size composition monitoring has been conducted on catches, but there is little local biological information available and mortality rates have not been estimated.	365
<a href="#">Wobbegong Sharks</a> <i>Orectolobus</i> spp.	Undefined	The available catch data are not sufficiently accurate to use for determining stock status for any of the three species which occur off NSW. More detailed reporting is now required on commercial catch return forms.	369
<a href="#">Yellowfin Bream</a> <i>Acanthopagrus australis</i>	Fully Fished	The yellowfin bream has a long history of stability of both the length composition and commercial catch rate data. The species is the basis of very significant recreational and commercial fisheries in NSW.	373
<a href="#">Yellowfin Tuna</a> <i>Thunnus albacares</i>	Fully Fished	Mainly a Commonwealth fishery off eastern Australia, with some uncertainty about the degree of overlap with the much larger western and central Pacific stock. Status has been adopted consistent with the Commonwealth assessment - 'not overfished', but there is some concern about high rates of fishing in the western and central Pacific.	377
<a href="#">Yellowtail Kingfish</a> <i>Seriola lalandi</i>	Growth Overfished	Catch rates of commercial line fishers have improved since the 1990s. Size composition data indicate the stock remains growth overfished.	381
<a href="#">Yellowtail Scad</a> <i>Trachurus novaezelandiae</i>	Fully Fished	A relatively long-lived small pelagic species which is significant in commercial and recreational catches, exploited throughout its range.	385

## Resource Assessment Performance

Key species have a range of requirements for resource assessment. A target Resource Assessment Class (RAC, see page xix for explanation) was originally nominated for each species and the current class is updated at the annual Resource Assessment Workshop. The following figure summarises the difference between current and target RAC for all species combined - a reduction in this indicator signifies that RACs are approaching their target levels. The table on the following page lists the current and target RACs for each species separately.

### *Performance Indicator for Resource Assessment*



**The sum of the difference between the current and target Resource Assessment Class ( $\Delta$ RAC) for all key commercial and recreational species, 2003/04 to 2008/09.**

SPECIES	RAC 2008/09	RAC TARGET
Angel Sharks	4	3
Australian Anchovy	4	3
Australian Bonito	2	2
Australian Sardine	2	2
Banded Rockcod	4	3
Bass Groper	4	3
Beachworms	4	3
Bigeyes	4	4
Blacklip Abalone	1	1
Blue Mackerel	2	2
Blue Swimmer Crab	2	2
Blue-eye Trevalla	3	2
Bluespotted Flathead	3	2
Boarfish	4	3
Broad Squid	3	3
Brown Tiger Prawn	4	3
Bugs	3	2
Catfish	4	3
Cobia	4	3
Cockles	4	3
Common Jack Mackerel	4	3
Common Silverbidy	4	3
Crimsonbanded Wrasse	4	3
Cunjevoi	4	3
Cuttlefish	4	3
Dart	4	2
Diamondfish	4	4
Dogfish	4	3
Dusky Flathead	3	2
Eastern Australian Salmon	2	2
Eastern Blue Groper	4	3
Eastern King Prawn	1	1
Eastern Pigfish	3	3
Eastern Red Scorpionfish	2	2
Eastern Rock Lobster	1	1
Eastern School Whiting	1	2
Eastern Sea Garfish	2	2
Flounders	4	3
Frigate Mackerel	4	3
Gemfish	1	1
Ghost Nipper	3	3
Ghostsharks	4	3
Giant Mud Crab	4	2
Goatfish	4	3
Goldspot Mullet	3	3
Greentail Prawn	4	3
Grey Morwong	2	2
Gummy Shark	4	3
Hairtail	4	3
Hammerhead Sharks	4	3
Hapuku	4	3
Jackass Morwong	4	3
John Dory	3	3
Longtail Tuna	4	4

SPECIES	RAC 2008/09	RAC TARGET
Luderick	3	2
Mackerel Tuna	4	4
Mahi Mahi	4	3
Mako Sharks	4	3
Mantis Shrimps	4	4
Mirror Dory	4	3
Mulloway	2	1
Ocean Jacket	2	2
Ocean Perch	4	3
Ocean Trawl Squid	4	3
Octopus	4	2
Pearl Perch	3	2
Pipi	3	2
Red Gurnard and Latchets	4	3
Redfish	3	3
Red Morwong	4	3
River Eels	3	2
River Garfish	3	3
Rock Blackfish	5	2
Royal Red Prawn	3	3
Sand Mullet	3	3
Sand Whiting	3	2
Sawsharks	4	3
Sea Urchins	3	2
School Prawn	1	2
Sea Mullet	2	1
Shovelnose Rays	4	2
Silver Sweep	3	2
Silver Trevally	2	2
Snapper	2	1
Soles	4	3
Southern Calamari	4	3
Southern Maori Wrasse	2	2
Spanish Mackerel	1	2
Spanner Crab	2	2
Spotted Mackerel	4	3
Stout Whiting	2	2
Striped Grunters	4	3
Striped Marlin	2	2
Tailor	1	2
Tarwhine	2	2
Teraglin	3	2
Tiger Flathead	1	1
Tiger Shark	4	3
Tilefish	4	3
Trumpeter Whiting	3	3
Turban Shells	4	3
Whaler Sharks	4	3
Whitebait - Sandy Sprat	4	3
Wobbegong Sharks	3	3
Yellowfin Bream	3	2
Yellowfin Tuna	1	2
Yellowtail Kingfish	2	2
Yellowtail Scad	2	2