

*Australian Government Department of Agriculture, Fisheries and Forestry  
Bureau of Rural Sciences*

## Fishery Status Reports | **2007**

Status of fish stocks managed by the Australian Government

*Edited by James Larcombe and Gavin Begg*

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# Foreword

The Bureau of Rural Sciences *Fishery status reports* provide an annual review of the status of domestic and international fish stocks managed or jointly managed by the Australian Government.

The reports are an independent assessment of the status of fish stocks and highlight emerging trends that may affect the fishing industry, fisheries management and the broader community. The 2007 reports show a decrease in the number of stocks classified as overfished and/or subject to overfishing. This confirms the turnaround in stock status observed in the 2006 reports, which followed a decade during which the number of overfished stocks had increased. There are still a number of stocks that are overfished or subject to overfishing, and this remains a cause for concern.

The number of stocks with an uncertain classification remains high and reducing uncertainty in stock status has become a priority of the Australian Government. New research targeted at reducing this uncertainty will be led by the Bureau of Rural Sciences over the next three years. Climate change is an emerging issue for fisheries that adds a further element of uncertainty.

The Commonwealth Fisheries Harvest Strategy Policy was released in September 2007. This policy clearly articulates the government's objectives for the management of fish stocks and illustrates the importance of sound scientific and economic advice to underpin the development of public policy and decision making in the fisheries sector. The Australian Fisheries Management Authority has now developed harvest strategies for all relevant fisheries. Well-founded harvest strategies should result in further improvements in the status of fish stocks.

**Karen Schneider**

*Executive Director*

BUREAU OF RURAL SCIENCES

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Phillips, K and Findlay, J 2008, 'Southern Bluefin Tuna Fishery', in: \*, pp. 93–102.

Morison, A 2008, 'Southern and Eastern Scalefish and Shark Fishery', in: \*, pp. 103–104.

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Sampaklis, A 2008, 'East Coast deepwater trawl sector', in: \*, pp. 165–166.

Morison, A 2008, 'Great Australian Bight trawl sector', in: \*, pp. 167–178.

McLoughlin, K 2008, 'Shark gillnet and hook sectors', in: \*, pp. 197–190.

Sahlqvist, P 2008, 'Southern Squid Jig Fishery', in: \*, pp. 191–198.

Phillips, K and Larcombe, J 2008, 'Heard Island and McDonald Islands Fishery', in: \*, pp. 199–209.

Woodhams, J 2008, 'Other Torres Strait fisheries', in: \*, pp. 210–217.

Woodhams, J 2008, 'Coral Sea Fishery', in: \*, pp. 218–222.

Sands, A 2008, 'Skipjack fisheries', in: \*, pp. 223–227.

Hobsbawn, P and Summerson, R 2008, 'Small Pelagics Fishery', in: \*, pp. 228–232.

McLoughlin, K and Moore, A 2008, 'Bass Strait Central Zone Scallop Fishery', in: \*, pp. 233–238.

Morison, A 2008, 'South Tasman Rise Trawl Fishery', in: \*, pp. 239–241.

Richardson, C and Larcombe, J 2008, 'Macquarie Island Toothfish Fishery', in: \*, pp. 242–244.

Sampaklis, A 2008, 'Western Deepwater Trawl Fishery', in: \*, pp. 245–247.

Sampaklis, A 2008, 'North West Slope Trawl Fishery', in: \*, pp. 248–250.

McLoughlin, K 2008, 'Western Australian Southern Demersal Gillnet and Longline Fishery', in: \*, pp. 251–254.

McLoughlin, K 2008, 'Northern Shark Fishery', in: \*, pp. 255–259.

McLoughlin, K 2008, 'Northern Finfish Fishery', in: \*, pp. 260–263.

Sampaklis, A 2008, 'Norfolk Island Fishery', in: \*, pp. 265–267.

Richardson, C and Larcombe, J 2008, 'Antarctic waters', in: \*, pp. 268–270.

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The reports are an outcome of collaboration with fisheries researchers, management and industry throughout Australia. They draw on a number of unpublished reports from fishery assessment meetings and workshops organised and funded by the Australian Fisheries Management Authority (AFMA).<sup>1</sup> BRS appreciates the access to the information, and acknowledges the input of the scientists, industry members, fishery managers and other members of resource assessment groups who contributed to the meetings. BRS is grateful to CSIRO Marine Research and the fishery-research agencies of Queensland, New South Wales, Victoria, Tasmania, South Australia, Western Australia and the Northern Territory for their contributions. The Australian Bureau of Agricultural and Resource Economics is thanked for its contribution of economic information.

The status reports covering tuna fisheries required the use of data and assessments compiled by regional fisheries management organisations, including the Secretariat of the

Pacific Community, the Western and Central Pacific Fisheries Commission, the Indian Ocean Tuna Commission and the Commission for the Conservation of Southern Bluefin Tuna.

BRS acknowledges the following data sources used in compiling maps:

- Geoscience Australia: coastline, state boundaries, place names, bathymetric features, Australian Fishing Zone and Exclusive Economic Zone boundaries
- AFMA: Australian Government fisheries logbook data, fisheries management boundaries
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR): CCAMLR statistical division boundaries
- Department of the Environment, Water, Heritage and the Arts: marine park boundaries.

The Food and Agriculture Organization of the United Nations (FAO) kindly gave permission to use drawings of banana prawn, yellowfin tuna, bigeye tuna, southern bluefin tuna, Patagonian toothfish and mackerel icefish. The sources of the FAO illustrations are:

- Collette, BB and Nauen, CE 1985, *FAO species catalogue. Vol. 2. Scombrids of*

<sup>1</sup> BRS gratefully acknowledges the officers of AFMA for their considerable assistance during the preparation of these reports, including the provision of information on management arrangements.

*the world. An annotated and illustrated catalogue of tunas, mackerels and related species known to date*, FAO Fish. Synop. 125, vol. 2 (tunas).

- Fischer, W and Hureau, J (eds) 1983, *FAO species identification sheets for fishery purposes. Southern Ocean (Fishing Areas 48, 58 and 88) (CCAMLR Convention Area)*, prepared and published with the support of the Commission for the Conservation of Antarctic Marine Living Resources, FAO, Rome, vol. 2, pp. 233–470 (Patagonian toothfish and mackerel icefish).
- Fischer, W and Bianchi, G (eds) 1984, *FAO species identification sheets for fishery purposes. Western Indian Ocean (Fishery Area 51)*, prepared and printed with the support of the Danish International Development Agency (DANIDA), FAO, Rome, 6 vols (banana prawn).

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## Photo credits

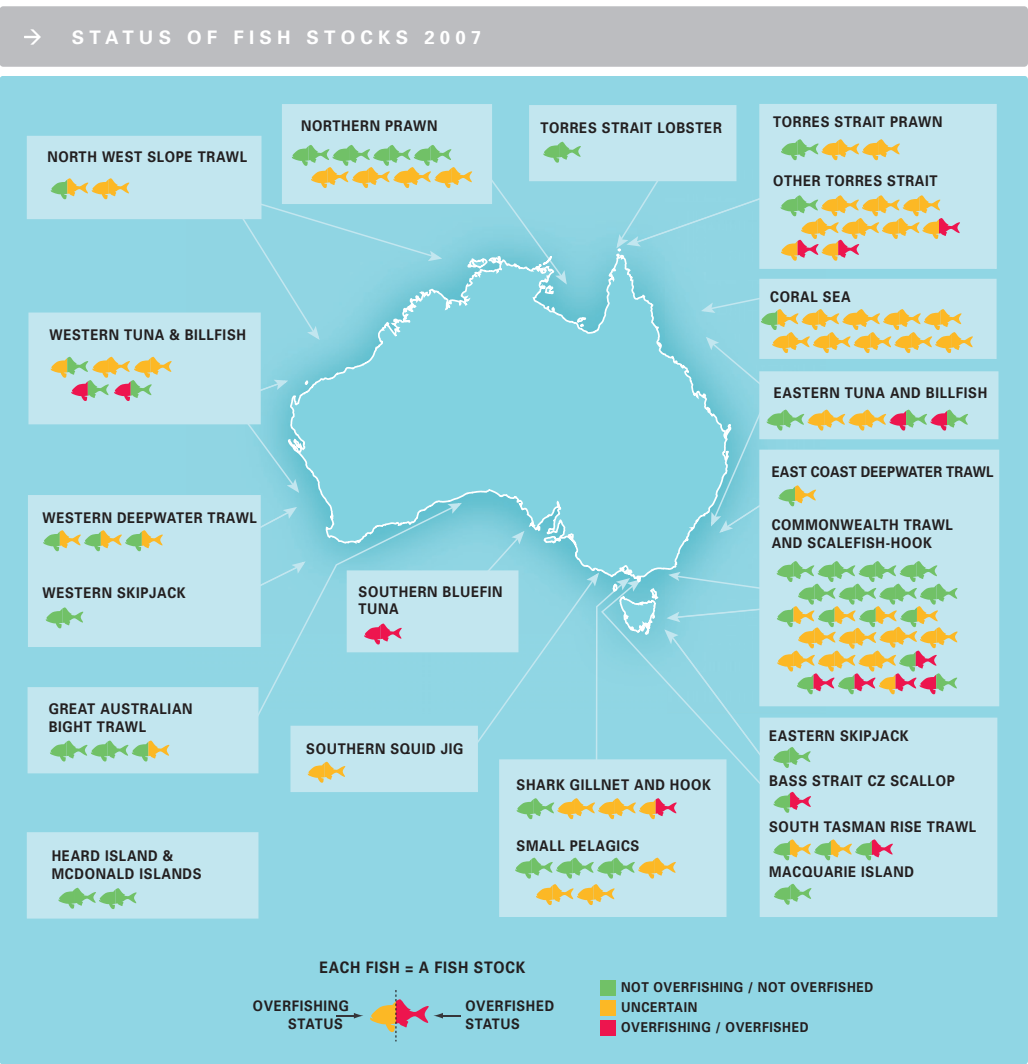
AFMA: pp. 63, 202, 205, 207.  
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 Brad Milic: pp. 72, 75, 81, 84, 104, 173, 178.  
 Katrina Phillips: pp. 1, 9, 96, 99, 100.  
 James Woodhams: pp. 42, 214, 215, 221.

## About the maps

The maps in this *Fishery status reports 2007* have been produced with ESRI ArcMap™. Most maps show relative fishing intensity (i.e. fishing effort), which has been classified as low, medium and high. The categories used depend on the fishery. The fishing data are from AFMA logbooks. Fishing effort contours were derived using a density function in the Spatial Analyst™ extension of ArcMap. Areas where the logbook data indicate that fewer than five boats are represented have been masked to preserve confidentiality. As far as possible, fishery management and sectoral boundaries have been included.

# Contents

<b>FOREWORD</b> . . . . .	v	Skipjack fisheries . . . . .	223
Citation . . . . .	vi	Small Pelagics Fishery . . . . .	228
<b>ACKNOWLEDGMENTS</b> . . . . .	vii	Bass Strait Central Zone Scallop Fishery . . . . .	233
<b>OVERVIEW</b> . . . . .	1	South Tasman Rise Trawl Fishery . . . . .	239
<b>FISHERY STATUS REVIEWS</b> . . . . .	25	Macquarie Island Toothfish Fishery . . . . .	242
Northern Prawn Fishery . . . . .	25	Western Deepwater Trawl Fishery . . . . .	245
Torres Strait Prawn Fishery . . . . .	39	North West Slope Trawl Fishery . . . . .	248
Torres Strait Lobster Fishery . . . . .	47	Western Australian Southern Demersal Gillnet and Longline Fishery . . . . .	251
Eastern Tuna and Billfish Fishery . . . . .	57	Northern Shark Fishery . . . . .	255
Western Tuna and Billfish Fishery . . . . .	77	Northern Finfish Fishery . . . . .	260
Southern Bluefin Tuna Fishery . . . . .	93	Norfolk Island Fishery . . . . .	265
Southern and Eastern Scalefish and Shark Fishery . . . . .	103	Antarctic Waters . . . . .	268
Commonwealth trawl and scalefish-hook sectors . . . . .	105	<b>AUSTRALIAN FISHERIES JURISDICTION AND FISHERY STATUS REPORTS</b> . . . . .	271
East Coast deepwater trawl sector . . . . .	165	<b>COMMON AND SCIENTIFIC NAMES OF SPECIES</b> . . . . .	274
Great Australian Bight trawl sector . . . . .	167	<b>GLOSSARY</b> . . . . .	278
Shark gillnet and hook sectors . . . . .	179	<b>ABBREVIATIONS AND ACRONYMS</b> . . . . .	292
Southern Squid Jig Fishery . . . . .	191		
Heard Island and McDonald Islands Fishery . . . . .	199		
Other Torres Strait fisheries . . . . .	210		
Coral Sea Fishery . . . . .	218		





# Overview

## Scope

The *Fishery status reports* have been produced by the Bureau of Rural Sciences (BRS) since 1992, when the *Fisheries Management Act 1991* came into effect. These reports provide governments, industry and the community with an independent overview of trends in the biological status of fish stocks in fisheries for which the Australian Government (the Commonwealth) has management responsibility. Management of these fisheries may be implemented unilaterally, with day-by-day management by the Australian Fisheries Management Authority (AFMA), or through joint authorities with state/territory governments, bilateral international agreements or broader regional or global international management entities.

## Stocks

*Fishery status reports 2007* summarises current information for 96 stocks, species or groups of species (all referred to as 'stocks'). Stocks were included if they were a primary target, had significant catches or were subject to a total allowable catch (TAC). Clearly separate sectors within a fishery, targeting distinct species or suites of species, were differentiated. On occasion, a species that was previously considered a single stock is now assessed as two stocks, resulting in the addition of one more stock to the reports.



*Vessel departing Port Lincoln*

The status of the many byproduct and bycatch species has not been reviewed. Current research is adding to the amount of information available and it is expected that an increased level of reporting on byproduct and bycatch species will be possible in future.

## Reporting period

*Fishery status reports 2007* was prepared during the first half of 2008 and is based on information available at that time. Stock assessment information usually derives from 2007 or earlier, while some management information (such as TACs) pertains to 2008. Catch information for most stocks extends to the end of 2007.

### **The Commonwealth Fisheries Harvest Strategy Policy**

The Commonwealth Fisheries Harvest Strategy Policy was released in September 2007. The policy makes the following observations on what constitutes good fisheries management:

- Fisheries are more efficient, profitable, stable and sustainable when stocks are larger than the stock size that produces the maximum sustainable yield ( $B_{MSY}$ ).
- Future productivity is at greater risk when stocks are reduced to a level at which the recruitment of young fish relative to the portion of the stock subject to fishing declines precipitously (referred to as ‘recruitment failure’).
- Fisheries should be managed on a whole-stock basis, and in a way that takes species life history characteristics (such as longevity, fecundity and recruitment variability) into account.
- Economic returns can be maximised and, in general, overcapitalisation can be avoided when fish stocks are maintained, on average, at a target adult biomass level that produces the maximum economic yield ( $B_{MEY}$ ).
- If stock sizes fall below  $B_{MEY}$ , the associated increase in fishing costs is greater than the increase in fishing revenue, and fishing is less efficient.

The objective of the policy is the sustainable and profitable utilisation of Australia’s Commonwealth-managed fisheries in perpetuity through the implementation of harvest strategies that maintain key commercial stocks at ecologically sustainable levels. Within that

context, the policy’s aim is to maximise economic returns to the Australian community.

Individual harvest strategies are to be developed that will pursue maximum economic yield from each fishery and ensure that stocks remain above levels at which risk is unacceptably high.

Specifically, harvest strategies have the following aims:

- Seek to maintain fish stocks, on average, at a target biomass ( $B_{TARG}$ ) equal to the stock size required to produce maximum economic yield ( $B_{MEY}$ ). In cases where  $B_{MEY}$  is unknown, a proxy of 1.2  $B_{MSY}$  (or a level 20% higher than a given proxy for  $B_{MSY}$ ) is to be used for a single-species fishery; for a multispecies fishery, judgment needs to be exercised. An alternative proxy for  $B_{MEY}$  may be used if it can be demonstrated that it is more appropriate.
- Ensure that fish stocks remain above a biomass level at which the risk to the stock is regarded as too high; that is, the limit biomass level ( $B_{LIM}$ ) or a proxy equal to or greater than 0.5  $B_{MSY}$  (or its proxy).
- Ensure that the stock stays above  $B_{LIM}$  at least 90% of the time. For highly variable, abundant species that may naturally breach  $B_{LIM}$  (that is, in the absence of fishing), the harvest strategy for the species must be consistent with the intent of the policy.

The policy contains more detail, and is accompanied by guidelines to support harvest strategy development for the

## → Stock status *continued*

variety of Commonwealth-managed fisheries (including input- and output-managed fisheries, single- and multispecies fisheries, and large and small fisheries, and in data-rich and data-poor situations). The guidelines also provide important contextual information to assist interpretation of the policy and support harvest strategy development and implementation. The policy has important ramifications for assessing stock status.

### Reference points and indicators

The status of a stock depends on its current size (biomass) and the rate of removals from it (known as the exploitation rate or ‘fishing mortality’). Reference points commonly define target and limit levels for the stock’s biomass ( $B_{TARG}$  and  $B_{LIM}$ , respectively) and target and limit rates for fishing mortality ( $F_{TARG}$  and  $F_{LIM}$ , respectively; see table).

### Status classifications

Five classifications of stock status are used in this report:

- **Not overfished** refers to the biomass of a fish stock. The biomass is adequate; more technically, the stock has a biomass above the limit reference point ( $B_{LIM}$ ).
- **Overfished** refers to the biomass of a fish stock. There are too few fish left; more technically, the stock has a biomass below the limit reference point. The Commonwealth Fisheries Harvest Strategy Policy requires that fish stocks remain above a biomass level at which the risk to the stock is regarded as too high ( $B_{LIM}$  or a proxy). Two common proxies for that limit are  $0.5 B_{MSY}$  (half the biomass required for maximum sustainable yield) and  $B_{20}$  (20% of the unfished biomass).

#### MORTALITY RATE AND BIOMASS REFERENCE POINTS

FISHING MORTALITY RATE (F)		$F < F_{TARG}$	$F_{TARG} < F < F_{LIM}$	$F > F_{LIM}$
BIOMASS (B)	$B \geq B_{TARG}$	Not overfished; overfishing is not occurring—can increase fishing mortality	Not overfished; overfishing is not occurring, but reduce fishing mortality	Not overfished; overfishing is occurring—possible fish-down, but need to reduce fishing mortality
	$B_{TARG} > B > B_{LIM}$	Not overfished, but rebuild stock to $B_{TARG}$ ; overfishing is not occurring	Not overfished, but rebuild stock; overfishing is not occurring, but reduce fishing mortality	Not overfished, but rebuild stock; overfishing is occurring—reduce fishing mortality
	$B < B_{LIM}$	Overfished—adopt and follow rebuilding plan; overfishing is not occurring	Overfished—adopt and follow rebuilding plan; overfishing is not occurring, but reduce fishing mortality	Overfished—overfishing is occurring; high risk area—reduce fishing mortality, adopt and follow rebuilding plan

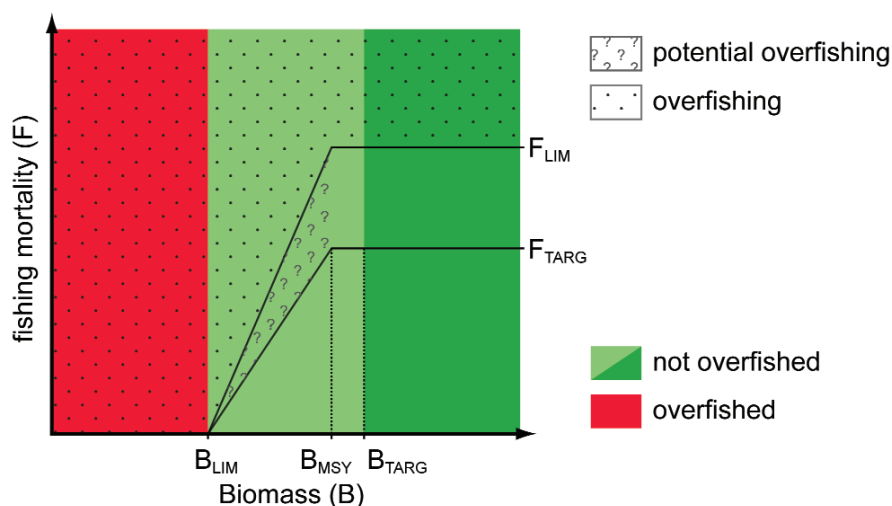
Source: Adapted from the United States National Oceans and Atmospheric Administration *Advisory report on stock status 1998*.

## → Stock status *continued*

- **No overfishing** refers to the amount of fishing. The stock is not undergoing too much fishing; that is, the amount of fishing does not exceed the limit reference point.
- **Overfishing** refers to the amount of fishing. The stock is undergoing too much fishing; that is, the amount of fishing exceeds the limit reference point. The policy indicates that any directed fishing on an overfished stock amounts to overfishing.
- **Uncertain** refers to the overfished or

overfishing status of a fish stock for which there is inadequate information. Stocks are classified independently in the overfished and overfishing categories. There are practical implications in the distinction between overfished stocks and overfishing. Management measures might curtail overfishing, but an overfished classification continues to apply until the stock recovers, which for some stocks can take many years.

HARVEST STRATEGY



An example of a harvest strategy (or harvest control rule) that is consistent with the Commonwealth Fisheries Harvest Strategy Policy—stock status is indicated by hatching and colours, relative to biomass on the horizontal axis and to fishing mortality on the vertical axis.

## Changed status definitions

The status classification system used in the *Fishery status reports* was changed in 2004. The ‘underfished’ and ‘fully fished’ categories were replaced by a combined category: ‘not overfished’. The change was made partly because of the potential confusion about the meaning of ‘fully fished’ (some considered that it implied that the level of fishing was too high). It was also often difficult to classify a stock as underfished, because there was often a lack of data for stocks likely to fall into that category.

Another change was to draw a distinction between a stock that is overfished and one that is subject to overfishing. The overfished and overfishing categories are generally separated in the current report, except where they must be combined to reveal long-term trends in status.

## Trends in *Fishery status reports*, 1992 to 2007

Since they were first published in 1992, the *Fishery status reports* have provided classifications of stock status for the principal stocks in fisheries managed by the Australian Government. The table below (‘Status classifications by year, 1992 to 2007’) shows the number of stocks in each status category, for each of the reports.<sup>2</sup> The total number of stocks examined has tended to increase with each edition. Stocks are included in the reports (or occasionally removed) using the following criteria:

- principal target stocks of large and medium sized fisheries
- all stocks for which there is a TAC
- sectors within smaller fisheries that target distinctly different suites of species.

Some stocks that have been assigned a lower priority, as well as many byproduct species, remain unclassified.

Stock additions and removals in the 2007 edition are as follows:

- Western Deepwater Trawl Fishery: 3 stocks removed (big-spined boarfish, smooth oreo and spiky oreo)
- Small Pelagics Fishery: 3 stocks added (by splitting jack mackerel, redbait and blue mackerel into eastern and western stocks)
- Small Pelagics Fishery: 1 stock removed (yellowtail scad)
- Torres Strait fisheries: 1 stock removed (other bêche-de-mer)
- Coral Sea Fishery: 1 stock added (by splitting the demersal line and demersal trawl sectors).

This means that 96 stocks are considered in 2007, compared with 97 stocks in 2006.

Five stocks are removed in the 2007 reports because they have not been targeted or have not formed a principal part of their respective fisheries in recent years.

The stocks included in the summary tables of this chapter are only from fisheries where the Australian Government has primary management responsibility. Therefore, stocks from the Western Australia Southern Demersal Gillnet and Longline Fishery, Northern Shark Fishery and Northern Finfish Fishery are not included in the summary tables.

## 2007 results and trends

Of the 96 stocks classified in the *Fishery status reports 2007*, 16 are classified as overfished and/or subject to overfishing. Of those, 10 stocks are overfished only, 5 stocks are subject to overfishing only and 1 stock is both overfished and subject to overfishing. Another 28 stocks are classified as not overfished, and 52 are classified as uncertain. Of stocks that are managed solely by the Australian Government, one is assessed as subject to overfishing: pink ling in the Southern and Eastern Scalefish and Shark Fishery (SESSF).

<sup>2</sup> Classification categories used in *Fishery status reports* 2004, 2005 and 2006 differ from those of previous reports. Species previously classified as ‘underfished’ or ‘fully fished’ are combined in the table as ‘not overfished’. Overfishing counts for previous years are not available.

	STATUS CLASSIFICATIONS BY YEAR, 1992 TO 2007												
	1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005	2006	2007
Not overfished	17	29	28	28	20	18	17	19	20	17	19	27	28
Overfished and/or overfishing	5	5	3	3	4	6	7	11	16	17	24	19	16
Uncertain	9	9	13	17	31	35	38	34	34	40	40	51	52
Total stocks assessed	31	43	44	48	55	59	62	64	70	74	83	97	96

Following a 7-year period in which the number of not overfished stocks remained stable at around 19, the number of stocks classified as not overfished increased to 27 in 2006 and to 28 in 2007.

The number of stocks classified as overfished and/or subject to overfishing increased from 1996 to 2005, peaking at 24. This trend was reversed from 2006; the number fell to 19 in 2006 and to 16 in 2007. Of the 19 stocks classified as overfished and/or subject to overfishing in 2006, 15

remain in that classification in 2007: deepwater sharks; eastern gemfish; orange roughy (SESSF stocks); smooth oreo dory; school shark; southern scallop; bigeye tuna (Pacific Ocean); yellowfin tuna (Pacific Ocean); swordfish (Indian Ocean); yellowfin tuna (Indian Ocean); southern bluefin tuna; orange roughy (South Tasman Rise Fishery); and sandfish, black teatfish and surf redfish (bêche-de-mer) in Torres Strait. In addition, pink ling was newly classified as overfished and/or subject to overfishing in 2007.

OVERFISHED AND OVERFISHING CLASSIFICATIONS, 2004 TO 2007				
STOCK STATUS	2004	2005	2006	2007
Overfished	14	17	15	11
Overfishing	9	12	5	6

Stocks classified as overfished numbered 17 in 2005, 15 in 2006 and 11 in 2007. Blue warehou, other oreo dories, redfish (eastern) and silver trevally are no longer classified as overfished in 2007. The status of these four stocks has become uncertain.

The number of stocks classified as subject to overfishing was 12 in 2005, 5 in 2006 and 6 in 2007. The six stocks classified as subject to overfishing in the *Fishery status reports 2007* are pink ling in the SESSF; southern bluefin tuna; bigeye tuna and yellowfin tuna in the Pacific Ocean; and swordfish and yellowfin tuna in the Indian Ocean. Pink ling is managed by AFMA, and the other five stocks are managed internationally through regional fisheries management organisations.

The number of stocks classified uncertain has tended to increase since the inception of the *Fishery status reports*. Much of the increase is a consequence of the addition over time of new stocks not previously considered. However, in other cases, revised assessments of stocks already classified have indicated that less was known about the actual status of a stock than was previously thought, or the assessments have become dated. The high proportion of stocks classified as uncertain is a continuing cause for concern and highlights the importance of a precautionary approach in fisheries management. Uncertainty is often linked to low-value fisheries where there is a lack of funding to conduct data collection and research.

## Stocks with a changed status (2006 versus 2007)

FISHERY	COMMON NAME	2006 STATUS		2007 STATUS	
		Overfishing	Overfished	Overfishing	Overfished
Torres Strait Lobster Fishery	Tropical rock lobster				
SESSF (Commonwealth trawl and scalefish-hook)	Blue warehou				
SESSF (Commonwealth trawl)	Gemfish (eastern)				
SESSF (Commonwealth trawl)	Jackass morwong				
SESSF (Commonwealth trawl)	Mirror dory				
SESSF (Commonwealth trawl)	Oreo dory: other				
SESSF (Commonwealth trawl and scalefish-hook)	Pink ling				
SESSF (Commonwealth trawl)	Redfish (eastern)				
SESSF (Commonwealth trawl)	Silver trevally				
SESSF (East Coast deepwater trawl)	Alfonsino				
SESSF (Great Australian Bight trawl)	Deepwater flathead				
SESSF (Great Australian Bight trawl)	Orange roughy				
Torres Strait Bêche-de-mer Fishery	Sandfish				
Torres Strait Bêche-de-mer Fishery	Black teatfish				
Torres Strait Bêche-de-mer Fishery	Surf redfish				
Coral Sea Fishery: Bêche-de-mer sector	Sandfish				
Small Pelagics Fishery	Redbait—East				
South Tasman Rise Trawl Fishery	Orange roughy				
South Tasman Rise Trawl Fishery	Smooth oreo				
South Tasman Rise Trawl Fishery	Spiky oreo				

Not overfished/Not overfishing     Uncertain     Overfished/Overfishing

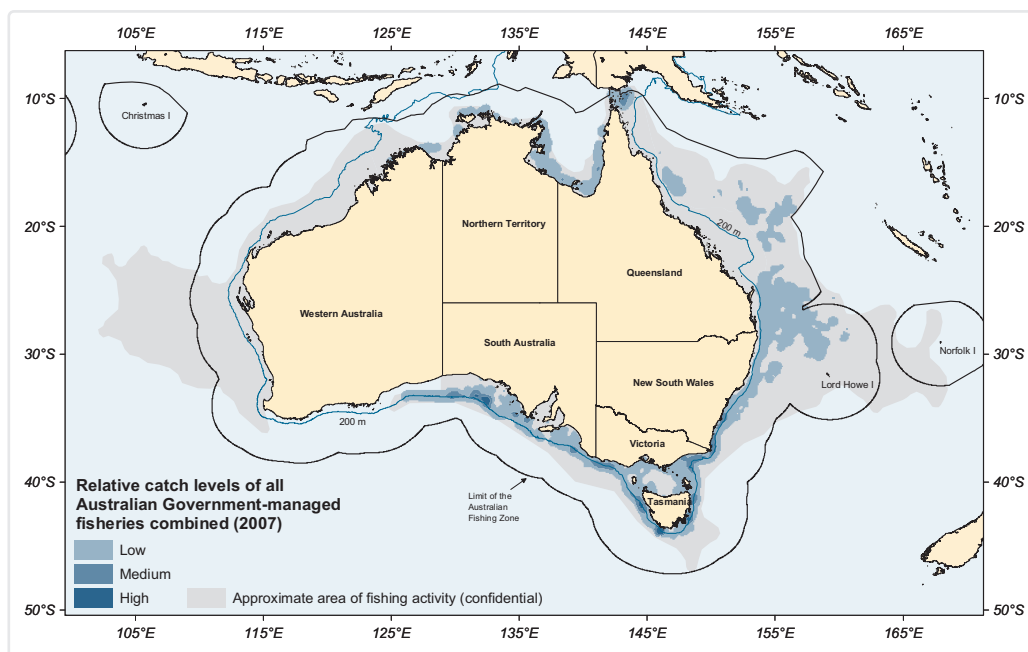
## Structural adjustment and 2005 ministerial direction

From 1992 to 2005, *Fishery status reports* showed a trend of continued overfishing, increasing numbers of overfished stocks, and continued high levels of uncertainty about stock status. In late 2005, the Australian Government responded to this situation by announcing *Securing our Fishing Future*, a \$220 million package to give overfished stocks a chance to rebuild and to improve profitability in the fishing industry. The package included a structural adjustment component to reduce the number of fishers

competing for fisheries resources and to maximise the opportunity for profitable fishing businesses. The structural adjustment component of the package was largely completed during the second half of 2006, and included significant removals of fishing capacity from the SESSF, the Northern Prawn Fishery and the Eastern Tuna and Billfish Fishery.

Linked to the package was a ministerial direction by the Minister for Fisheries, Forestry and Conservation to AFMA pursuant to section 91 of the *Fisheries Administration Act 1991*. The direction stated that ‘decisive action is needed immediately to halt





overfishing and to create the conditions that will give overfished stocks a chance to recover to an acceptable level in the near future'. The direction specified a number of measures to be implemented to improve the management of Commonwealth managed fish stocks. In the two years following the ministerial direction, AFMA implemented additional management measures intended to halt overfishing and bring about recovery of overfished stocks. For example, in the SESSF those measures included TAC reductions and additional area and depth closures.

The 2005 ministerial direction has had a significant impact on the management of Commonwealth fisheries, and this has flowed on to changes in stock status, particularly for stocks subject to overfishing. It also brought about the development of the Commonwealth Fisheries Harvest Strategy Policy.

## Harvest strategies

In accordance with the 2005 ministerial direction, the Department of Agriculture, Fisheries and Forestry developed the Commonwealth Fisheries Harvest Strategy

Policy, which was released in September 2007. Harvest strategies developed under the policy should set out the management actions necessary to produce the maximum economic yield and ensure that fish stocks remain above levels at which the risk to the stock is unacceptably high. AFMA (including its management advisory committees and resource assessment groups) is responsible for implementing the policy.

The policy requires that harvest strategies be developed for most Commonwealth fisheries, with the exception of those that are managed under the joint authority of the Australian Government and another Australian jurisdiction or international management body or arrangement. However, the policy notes that the Australian Government will advocate the principles of the policy within jointly managed fisheries.

For international fisheries, AFMA has determined that harvest strategies are not required for the Southern Bluefin Tuna Fishery and the Heard Island and McDonald Islands Fishery because they are part of international arrangements with acceptable scientific processes for setting sustainable



catch levels. AFMA has developed harvest strategies for other international fisheries, such as the Eastern and Western Tuna and Billfish fisheries. Following the policy, AFMA has not developed harvest strategies for the domestic jointly managed fisheries, such as the Torres Strait and other joint-authority fisheries.

For most Commonwealth-managed fisheries, 2008 is a trial year for the newly developed harvest strategies, which will be reviewed in 2009. The trial period is intended to provide time for identifying and addressing effectiveness and implementation problems.

Economics have not yet been incorporated into target reference points and stock assessments for most Commonwealth fisheries. The Northern Prawn Fishery is the only fishery that is currently pursuing  $B_{MEY}$  directly (for a suite of tiger and endeavour prawn species), while the SESSF is pursuing 1.2  $B_{MSY}$  as a proxy for  $B_{MEY}$ .

## Outlook

Like most maritime countries, Australia faces many challenges in managing its fisheries resources. Australian fisheries generally have an international reputation for being well managed, however, the resources appear vulnerable to overexploitation because of the low productivity of some areas of the marine environment and intensive harvesting by well-developed commercial and recreational fisheries.

The full effect of the 2005 ministerial direction, structural adjustment and harvest strategies will become apparent over a number of years. The improvement in stock status seen in the 2006 and 2007 editions of the *Fishery status reports* is partly a result of management changes following the ministerial direction—particularly the fall in stocks subject to overfishing. Some stocks will be quick to rebuild from an overfished status, while others will take many years to recover.

There has been an improvement in the status classification of stocks—most notably the substantial reduction of overfishing



*Southern bluefin tuna farm*

classifications in *Fishery status reports* 2006 and 2007. This is best exemplified by the SESSF, where there were significant reductions in TAC for a number of stocks following the introduction of a harvest strategy in 2005 and also in response to the ministerial direction. In addition, closures have halted overfishing of several deepwater stocks. Significant efforts have been made to develop and improve harvest strategies in the SESSF, particularly for stocks for which there is poor or little information. Those efforts have informed the development of harvest strategies for other Commonwealth-managed fisheries and will continue to do so. An unresolved problem is the setting of a single SESSF-wide TAC for a species when the fishery exploits more than one stock. This problem has resulted in pink ling being classified as subject to overfishing (because fishing mortality is too high for the eastern stock, which is depleted to below target levels). Eight stocks in the SESSF are still overfished, and some can be expected to remain overfished for many years.

The level of fishing effort has fallen in most Commonwealth fisheries over the past several years. This appears to have been primarily because of economic and business conditions, such as currency exchange rates, costs of labour and fuel, prices obtained for

product and competition from imported product. In some fisheries, part of the fall in effort has been because of the removal of effort through structural adjustment (this includes the SESSF, the Northern Prawn Fishery and the Eastern Tuna and Billfish Fishery). Several smaller fisheries had zero, or close to zero, effort and catch in 2007—with the effect that those stocks may be assessed as not subject to overfishing. The escalating costs of fuel over 2007 had a marked effect on day-to-day practices in fisheries that are particularly fuel intensive.

Reducing uncertainty in the status of Commonwealth fish stocks is a priority for the Australian Government, which has allocated funds over the next 3 years for that purpose. Dedicated work on ‘uncertain’ stocks, coupled with the further development of harvest strategies, should lead to an increase in reliable assessment information and a decrease in uncertain classifications.

## Environmental issues

The management of environmental issues relating to fisheries, such as bycatch and impacts on habitats and the broader ecosystem, is being incorporated increasingly into AFMA’s fisheries management. This has been in response to a number of drivers, including the ecologically sustainable development objective of the *Fisheries Management Act 1991*, the Commonwealth Policy on Fisheries Bycatch (2000) and the assessment of fisheries under the *Environment Protection and Biodiversity Conservation Act 1999*.

Since 2000, bycatch action plans have been used in the major fisheries to identify and address impacts on bycatch species. Specific management measures have also been introduced in several fisheries to reduce the level of bycatch. Because of concerns that the environmental management of some fisheries required improvement, the 2005 ministerial direction stated that AFMA must manage the broader environmental impacts of fishing, including minimising the levels of interaction

with protected species. In response, AFMA established a bycatch and discarding program in February 2007 to provide additional resources and direction to pursue policy and legislative objectives in this area. The program’s initial direction is to deal with high-risk and protected species, and also to reduce discarding of target and quota species as far as is practically possible.

AFMA is completing a major effort to undertake ecological risk assessments of its fisheries. This research is identifying the risk that fisheries pose to non-target species and ecosystem components affected by fisheries and should provide a focus for activities to mitigate impacts on those species. The results of the risk assessments and the associated ecological risk management responses should be available in late 2008.

The status of most of the species caught incidentally to target stocks is not assessed in the *Fishery status reports 2007*, even though some byproduct species contribute substantially to the market value of some fisheries. The results of the ecological risk assessments might be useful for assessing the status of those species in future.



Unloading catch, Eden

## International fisheries

The Australian Government is party to a number of international conventions or agreements for the management of highly migratory fish stocks that range far beyond the Australian Fishing Zone (see *Australian fisheries jurisdiction and Fishery status reports* chapter). Those stocks are exploited across various exclusive economic zones, as well as on the high seas. Responsibility for their management is shared by multiple governments through regional fisheries management organisations. Five of the six stocks classified as subject to overfishing in the *Fishery status reports 2007* are highly migratory tunas and billfishes that are taken by these international fisheries.

A 2006 United Nations General Assembly resolution on sustainable fisheries called on countries to develop and apply best practice guidelines for regional fisheries management organisations, and to undertake performance reviews of those organisations, based on transparent criteria. The three organisations concerned with the five stocks subject to overfishing are undergoing performance reviews in 2008 (the Commission for the Conservation of Southern Bluefin Tuna, the Indian Ocean Tuna Commission and the Western and Central Pacific Fisheries Commission).

## Summary table of stock status

The summary table of stock status (pages 12–23) summarises information from the individual fishery reviews. It indicates the status classification assigned in each *Fishery status report* since 1992, as well as the overfishing and overfished status in 2007. It also gives the main indicator of stock status and reference points against which status is assessed. This is generally a comparison of stock biomass, catch, effort and/or catch rates, with quotas, permits, trigger catch rates and biological targets as applicable.

The number of stocks that have been classified has increased since the reports began. Nevertheless, some byproduct species



Mending the trawl net

assigned lower priority and a wide range of bycatch species remain unclassified. The fisheries encompassed in the table do not include those where state or territory government agencies have primary management responsibility, that is, the Western Australian Southern Demersal Gillnet and Longline Fishery, the Cocos (Keeling) Islands Fishery, the Christmas Island Fishery, the Northern Shark Fishery and the Northern Finfish Fishery.

Overfished and overfishing categories were not separated before 2004 and so are combined in the table to allow comparisons across years. Underfished and fully fished categories, which were separately assigned before 2004, are combined in the table as 'not overfished'.

Information on trends in catches and catch rates are used as indicators of a fishery's performance, but the classification of the status of a stock or fishery requires consideration of a wider range of factors—the substance of the individual fishery chapters. The status classifications (overfishing, not subject to overfishing, overfished, not overfished or uncertain) are simplified summary indicators based on those factors.

→ STATUS SUMMARY

FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	STATUS HISTORY <sup>B</sup>										
			1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
Northern Prawn Fishery	White banana prawn	<i>Fenneropenaeus merguensis</i>											
Northern Prawn Fishery	Red-legged banana prawn	<i>Fenneropenaeus indicus</i>											
Northern Prawn Fishery	Brown tiger prawn	<i>Penaeus esculentus</i>											
Northern Prawn Fishery	Grooved tiger prawn	<i>Penaeus semisulcatus</i>											
Northern Prawn Fishery	Blue endeavour prawn	<i>Metapenaeus endeavouri</i>											
Northern Prawn Fishery	Red endeavour prawn	<i>Metapenaeus ensis</i>											
Northern Prawn Fishery	Blue-legged king prawn	<i>Penaeus latisulcatus</i>											
Northern Prawn Fishery	Red-spot king prawn	<i>Melicertus longistylus</i>											
Torres Strait Prawn Fishery	Blue endeavour prawn	<i>Metapenaeus endeavouri</i>											
Torres Strait Prawn Fishery	Brown tiger prawn	<i>Penaeus esculentus</i>											
Torres Strait Prawn Fishery	Red-spot king prawn	<i>Melicertus longistylus</i>											
Torres Strait Lobster Fishery	Tropical rock lobster	<i>Panulirus ornatus</i>											
Eastern Tuna and Billfish Fishery	Albacore tuna	<i>Thunnus alalunga</i>											
Eastern Tuna and Billfish Fishery	Bigeye tuna	<i>Thunnus obesus</i>											
Eastern Tuna and Billfish Fishery	Striped marlin	<i>Tetrapturus audax</i>											
Eastern Tuna and Billfish Fishery	Swordfish	<i>Xiphias gladius</i>											
Eastern Tuna and Billfish Fishery	Yellowfin tuna	<i>Thunnus albacares</i>											
Western Tuna and Billfish Fishery	Albacore tuna	<i>Thunnus alalunga</i>											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified

	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					surveys, catch and CPUE	n.a.	High natural recruitment variability, primarily linked to environmental factors. Continued reductions in NPF effort suggest that overfishing is unlikely.
					surveys, catch and CPUE	n.a.	Stability of catches and species biology provide no evidence of recruitment overfishing. Reductions in NPF effort indicate that overfishing is unlikely.
					spawning biomass, fishing effort	target MEY, limit 0.5 B <sub>MSY</sub>	Spawning biomass not overfished and current fishing effort low and not overfishing. MEY target applies across multiple species.
					spawning biomass, fishing effort	target MEY, limit 0.5 B <sub>MSY</sub>	Spawning biomass not overfished and current fishing effort low and not overfishing. MEY target applies across multiple species.
					surveys, catch and CPUE	target MEY	Byproduct species with catches linked to tiger prawn catch. Preliminary stock assessment developed. Contributes to MEY target of tiger prawns.
					surveys, catch and CPUE	target MEY	Byproduct species with catches linked to tiger prawn catch. Preliminary stock assessment developed. Contributes to MEY target of tiger prawns.
					surveys, catch and CPUE trends	n.a.	Byproduct species with catches linked to tiger prawn catch. No current assessment but some recent concern over declining catches.
					surveys, catch and CPUE trends	n.a.	Byproduct species with catches linked to tiger prawn catch. No current assessment but some recent concern over declining catches.
					none specified	n.a.	Stock assessment in development for this species.
					biomass	target B <sub>MSY</sub> and E <sub>MSY</sub>	Effort in 2007 was below E <sub>MSY</sub> . Most recent estimate of biomass is above the level required for MSY, with an increasing trend.
					none specified	n.a.	No stock assessment for this species.
					biomass and fishing mortality	target F <sub>MSY</sub> , B <sub>MSY</sub> limit F <sub>LIM</sub> , B <sub>LIM</sub>	Biomass estimates indicate that stocks remain above B <sub>MSY</sub> . Localised overfishing is thought to be occurring in the Papua New Guinea area of the fishery. 2007 catches fell short of expectations.
					biomass	limit F <sub>MSY</sub> and B <sub>MSY</sub> (WCPFC)	South Pacific assessment indicates biomass is well above biomass required for MSY. Fishery targets a narrow band of very old age classes.
					biomass	limit F <sub>MSY</sub> and B <sub>MSY</sub> (WCPFC)	Current levels of fishing and historical average recruitment will move stock to an overfished state. Lightly exploited in ETBF, but heavily affected by equatorial fishing.
					biomass	limit F <sub>MSY</sub> and B <sub>MSY</sub> (WCPFC)	Preliminary assessment indicates range of plausible conclusions on stock status.
					biomass	limit F <sub>MSY</sub> and B <sub>MSY</sub> (WCPFC)	Range of plausible conclusions on stock status, with most indicating not overfished and no overfishing, but several indicating overfishing and overfished. Consistent trend in declining abundance in recent years in ETBF.
					biomass	limit F <sub>MSY</sub> and B <sub>MSY</sub> (WCPFC)	Overfishing in western Pacific. Current levels of fishing and historical average levels of recruitment may move stock to an overfished state lightly exploited in ETBF, but heavily affected by equatorial fishing.
					catch	no formal reference points	Not currently targeted by the fishery. Indian Ocean catches have declined since 2000.



→ STATUS SUMMARY

FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	STATUS HISTORY <sup>B</sup>										
			1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
Western Tuna and Billfish Fishery	Bigeye tuna	<i>Thunnus obesus</i>											
Western Tuna and Billfish Fishery	Striped marlin	<i>Tetrapturus audax</i>											
Western Tuna and Billfish Fishery	Swordfish	<i>Xiphias gladius</i>											
Western Tuna and Billfish Fishery	Yellowfin tuna	<i>Thunnus albacares</i>											
Southern Bluefin Tuna Fishery	Southern bluefin tuna	<i>Thunnus maccoyii</i>											
SESSF (Commonwealth trawl and scalefish-hook)	Blue-eye trevalla	<i>Hyperoglyphe antarctica</i>											
SESSF (Commonwealth trawl)	Blue grenadier	<i>Macruronus novaezelandiae</i>											
SESSF (Commonwealth trawl and scalefish-hook)	Blue warehou	<i>Seriolella brama</i>											
SESSF (Commonwealth trawl)	Deepwater shark (upper slope)	multiple species											
SESSF (Commonwealth trawl)	Deepwater shark (mid-slope)	multiple species											
SESSF (Commonwealth trawl)	Eastern school whiting	<i>Sillago flindersi</i>											
SESSF (Commonwealth trawl)	Flathead	<i>Neoplatycephalus richardsoni</i>											
SESSF (Commonwealth trawl)	Gemfish (eastern)	<i>Rexea solandri</i>											
SESSF (Commonwealth trawl)	Gemfish (western)	<i>Rexea solandri</i>											
SESSF (Commonwealth trawl)	Jackass morwong	<i>Nemadactylus macropterus</i>											
SESSF (Commonwealth trawl)	John dory	<i>Zeus faber</i>											
SESSF (Commonwealth trawl)	Mirror dory	<i>Zenopsis nebulosus</i>											
SESSF (Commonwealth trawl)	Ocean perch	<i>Helicolenus</i> spp.											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified

	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					biomass, MSY, F	no formal reference points	Not currently overfished. More optimistic Indian Ocean assessment in 2006 suggests not overfishing, but concern that fishing patterns may revert and that status may move back to overfishing.
					catch	no formal reference points	Predominantly byproduct species with no current assessment. Indian Ocean catches have declined since 1990s.
					biomass, MSY, F	no formal reference points	2006 Indian Ocean assessment suggests current fishing mortality greater than that required to achieve MSY, but not yet overfished.
					MSY, F	no formal reference points	Indian Ocean catch levels not sustainable, but stock not yet overfished.
					biomass	biomass to rebuild to target level	Spawning stock estimated at a low fraction of original biomass and low recruitment in recent years. Discovery of high levels of unreported catch over years has added significant uncertainty to assessment.
					ratio of F to M	target F = M, limit F = 2M (Tier 3)	Lower recent catches and a risk analysis of harvest control rules indicate that current catches are unlikely to constitute overfishing.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Spawning biomass is above the target but declining current catches pose low threat to the stock status.
					CPUE	n.a. (Tier 4)	Two stocks not managed separately. No current estimates of biomass. Catches greatly reduced, but it is still uncertain whether they constitute overfishing.
					bycatch	n.a. (Tier 4)	Trip limits on catches and closures introduced to protect gulper sharks.
					bycatch	n.a. (Tier 4)	TAC reduced for 2007 and closures to fishing below 700 m.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Stock below target levels, but current catches will not prevent rebuilding and do not constitute overfishing.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Current biomass close to target level and not overfished. Current catches do not constitute overfishing.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Assessment indicates that the stock is still overfished but recent catches do not constitute overfishing.
					CPUE	n.a. (Tier 4)	Current assessment does not give clear guidance on status. Catches in the Great Australian Bight are larger than in the Commonwealth trawl sector.
					biomass	target 50% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 2)	Current biomass from most recent assessment highly uncertain. Uncertain whether recent catches constitute overfishing.
					ratio of F to M	target F = M, limit F = 2M (Tier 3)	Current biomass uncertain. Low recent catches do not constitute overfishing.
					ratio of F to M	target F = M, limit F = 2M (Tier 3)	Current biomass uncertain. Low recent catches do not constitute overfishing.
					CPUE	n.a. (Tier 4)	Two species still managed under one TAC. Indicators do not give clear guidance on status.

→ STATUS SUMMARY

FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	STATUS HISTORY <sup>B</sup>										
			1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
SESSF (Commonwealth trawl)	Orange roughy	<i>Hoplostethus atlanticus</i>											
SESSF (Commonwealth trawl)	Orange roughy (Cascade Plateau)	<i>Hoplostethus atlanticus</i>											
SESSF (Commonwealth trawl)	Oreo dory: smooth	<i>Pseudocyttus maculatus</i>											
SESSF (Commonwealth trawl)	Oreo dory: smooth (Cascade Plateau)	<i>Pseudocyttus maculatus</i>											
SESSF (Commonwealth trawl)	Oreo dory: other	<i>Neocyttus rhomboidalis</i> , <i>Alloctytus niger</i> , <i>A. verrucosus</i> , <i>Oreosoma atlanticum</i>											
SESSF (Commonwealth trawl and scalefish-hook)	Pink ling	<i>Genypterus blacodes</i>											
SESSF (Commonwealth trawl)	Redfish (eastern)	<i>Centroberyx affinis</i>											
SESSF (Commonwealth trawl)	Ribaldo	<i>Mora moro</i>											
SESSF (Commonwealth trawl)	Royal red prawn	<i>Haliporoides sibogae</i>											
SESSF (Commonwealth trawl)	Silver trevally	<i>Pseudocaranx dentex</i>											
SESSF (Commonwealth trawl)	Silver warehou	<i>Seriotelella punctata</i>											
SESSF (East Coast deepwater)	Alfonsino	<i>Beryx splendens</i>											
SESSF (Great Australian Bight trawl)	Bight redfish	<i>Centroberyx gerrardi</i>											
SESSF (Great Australian Bight trawl)	Deepwater flathead	<i>Neoplatycephalus conatus</i>											
SESSF (Great Australian Bight trawl)	Orange roughy	<i>Hoplostethus atlanticus</i>											
SESSF (Shark gillnet and hook)	Elephant fish	<i>Callorhynchus milii</i>											
SESSF (Shark gillnet and hook)	Gummy shark	<i>Mustelus antarcticus</i>											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified



	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub>	Southern, eastern and western stock biomasses remain below limit reference points. Closures to trawling below 700 m and bycatch TACs have stopped overfishing.
					biomass	target 50% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 2)	Stock not overfished, and current catches are under a harvest strategy that does not constitute overfishing.
					bycatch	n.a.	Still considered to be overfished. Closures to trawling below 700 m and bycatch TACs indicate no overfishing.
					bycatch	n.a.	Current biomass levels uncertain. Bycatch TACs indicate no overfishing.
					CPUE	n.a. (Tier 4)	Overfished status has become uncertain. Closures to trawling below 700 m and bycatch TACs indicate no overfishing.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Two stocks under one TAC. New assessment shows eastern stock is well below target levels, and recent catches constitute overfishing. Western stock is not overfished and not subject to overfishing.
					ratio of F to M	target F = M, limit F = 2M (Tier 3)	No evidence yet of stock rebuilding. Discarding still an issue. TAC not constraining catches. Uncertain whether recent lower catches will allow rebuilding.
					ratio of F to M	target F = M, limit F = 2M (Tier 3)	Age structure indicates that current catches do not constitute overfishing and that stocks are not overfished.
					none specified	n.a.	Catch rates relatively stable. Recent reduced catches in SESSF but no quantitative assessment possible.
					CPUE	n.a. (Tier 4)	Evidence of stock decline, but uncertain whether biomass has been overfished. Much of the catch is from state waters and is unconstrained.
					biomass	target 40% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 1)	Updated assessment indicates that biomass is above target levels and catches are sustainable.
					CPUE	n.a. (Tier 4)	Lacking a comprehensive assessment. Very low effort and catch indicate that stocks are not subject to overfishing.
					biomass	target 50% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 2)	Current biomass well above target. Current catches do not constitute overfishing.
					biomass	target 50% B <sub>0</sub> , limit 20% B <sub>0</sub> (Tier 2)	Current biomass is above target reference points. Current catches do not constitute overfishing, but long-term sustainable catches are still uncertain.
					biomass	limit 20% B <sub>0</sub> , target 50% B <sub>0</sub>	Assessment not updated in 2006. Overfished status remains uncertain but current catch and closures indicate that stocks are not subject to overfishing.
					catch	n.a. (Tier 4)	Byproduct of gummy shark fishery. TAC in line with recommended biological catch.
					pup production	target 40% 1927 stock level (Tier 1)	Estimated pup production about 40% of the initial level in most areas.

## → STATUS SUMMARY

FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	STATUS HISTORY <sup>B</sup>										
			1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
SESSF (Shark gillnet and hook)	Saw sharks	<i>Pristiophorus</i> spp.											
SESSF (Shark gillnet and hook)	School shark	<i>Galeorhinus galeus</i>											
Southern Squid Jig Fishery	Arrow squid	<i>Nototodarus gouldi</i>											
Heard Island and McDonald Islands Fishery	Mackerel icefish	<i>Champscephalus gunnari</i>											
Heard Island and McDonald Islands Fishery	Patagonian toothfish	<i>Dissostichus eleginoides</i>											
Torres Strait Bêche-de-mer Fishery	Sandfish	<i>Holothuria scabra</i>											
Torres Strait Bêche-de-mer Fishery	Black teatfish	<i>Holothuria whitmaei</i>											
Torres Strait Bêche-de-mer Fishery	Surf redfish	<i>Actinopyga mauritiana</i> (likely a mix of <i>Actinopyga</i> spp.)											
Torres Strait Bêche-de-mer Fishery	White teatfish	<i>Holothuria fuscogilva</i>											
Torres Strait Bêche-de-mer Fishery	Prickly redfish	<i>Thelenota ananus</i>											
Torres Strait Mackerel Fishery	Spanish mackerel	<i>Scomberomorus commerson</i>											
Torres Strait Reef Line Fishery	Coral trout and mixed reef species	<i>Plectropomus</i> spp., mixed reef spp.											
Torres Strait Pearl Fishery	Pearl oyster	<i>Pinctada maxima</i>											
Torres Strait Trochus Fishery	Trochus	<i>Trochus niloticus</i>											
Torres Strait Crab Fishery	Mud crab, blue swimmer crab	<i>Scylla</i> spp. and <i>Portunus pelagicus</i>											
Coral Sea Fishery: Bêche-de-mer sector	Black teatfish	<i>Holothuria whitmaei</i>											
Coral Sea Fishery: Bêche-de-mer sector	White teatfish	<i>Holothuria fuscogilva</i>											
Coral Sea Fishery: Bêche-de-mer sector	Surf redfish	<i>Actinopyga mauritiana</i>											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified

	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					catch	n.a. (Tier 4)	Byproduct of gummy shark fishery. TAC in line with recommended biological catch.
					pup production	target 40% 1927 stock level (Tier 1)	Recommended biological catch zero because stock below limit reference point of 20% of initial pup production. Current catch mainly taken as bycatch in line with rebuilding strategy.
					catch	n.a.	No stock assessment. Catch and effort trigger limits set at precautionary levels in the harvest strategy.
					biomass	target > 75% B <sub>0</sub> , limit 20% B <sub>0</sub> (<10% chance)	Stock size fluctuates due to recruitment variability. Stock not overfished, and current catches are under a harvest strategy that does not constitute overfishing.
					biomass	target > 50% B <sub>0</sub> , limit 20% B <sub>0</sub> (<10% chance)	Stock not overfished, and current catches are under a harvest strategy that does not constitute overfishing. Illegal fishing reduced but still a potential problem.
					biomass	n.a. (zero TAC)	2004 surveys indicated no recovery since previous surveys. Overall density of sandfish at sites resurveyed in 2004 was 40% lower than in 2002.
					biomass	n.a. (zero TAC)	2005 surveys indicated no recovery since previous surveys. Density of black teatfish was lower at sites resurveyed in 2005, compared with 2002.
					biomass	n.a. (zero TAC)	2005 surveys observed no surf redfish indicating no recovery since previous survey.
					biomass	n.a. (under a TAC)	2005 survey indicated a decreased density and average size compared with previous survey. No mandatory reporting during 2007 contributes to uncertainty.
					biomass	n.a. (under a TAC)	2005 survey indicated a decreased density and average size compared with previous survey. No mandatory reporting during 2007 contributes to uncertainty.
					biomass, fishing mortality	n.a.	Catch in 2007 was below stock assessment estimates of MSY. A management plan for the fishery is in development.
					none specified	n.a.	There is no stock assessment for this fishery. A management plan is in development for the fishery.
					none specified	n.a.	No recent stock assessment. Size limits in place.
					none specified	n.a. (under a TAC)	No stock assessment. Size limits and TAC in place.
					none specified	n.a.	No stock assessment. Size limits in place.
					none specified	n.a. (under a TAC)	Lack of recent stock assessment and changes in management arrangements have increased uncertainty about stock status
					none specified	n.a. (under a TAC)	No stock assessment. Some recent changes to harvesting regime and management arrangements.
					none specified	n.a. (under a TAC)	No stock assessment. Some recent changes to harvesting regime and management arrangements.

## → STATUS SUMMARY

			STATUS HISTORY <sup>B</sup>										
FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
Coral Sea Fishery: Bêche-de-mer sector	Prickly redfish	<i>Thelenota ananus</i>											
Coral Sea Fishery: Bêche-de-mer sector	Sandfish	<i>Holothuria scabra</i>											
Coral Sea Fishery: Bêche-de-mer sector	Other bêche-de-mer species	various											
Coral Sea Fishery: Line and trap sector	Mixed reef fish	various											
Coral Sea Fishery: Trawl and trap sector	Demersal and mid-water fish and crustaceans	various											
Coral Sea Fishery: Aquarium collection sector	Multiple species	various											
Coral Sea Fishery: Lobster and trochus	Lobster and trochus species	<i>Panulirus ornatus</i> and mainly <i>Trochus niloticus</i>											
Skipjack Fishery: Pacific Ocean	Skipjack tuna	<i>Katsuwonus pelamis</i>											
Skipjack Fishery: Indian Ocean	Skipjack tuna	<i>Katsuwonus pelamis</i>											
Small Pelagics Fishery	Jack mackerel—east	<i>Trachurus declivis</i> , <i>T. symmetricus</i>											
Small Pelagics Fishery	Jack mackerel—west	<i>Trachurus declivis</i> , <i>T. symmetricus</i>											
Small Pelagics Fishery	Redbait—east	<i>Emmelichthys nitidis</i>											
Small Pelagics Fishery	Redbait—west	<i>Emmelichthys nitidis</i>											
Small Pelagics Fishery	Blue mackerel—east	<i>Scomber australasicus</i>											
Small Pelagics Fishery	Blue mackerel—west	<i>Scomber australasicus</i>											
Bass Strait Central Zone Scallop Fishery	Southern scallop	<i>Pecten fumatus</i>											
South Tasman Rise Trawl Fishery	Orange roughy	<i>Hoplostethus atlanticus</i>											
South Tasman Rise Trawl Fishery	Smooth oreo	<i>Pseudocyttus maculatus</i>											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified

	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					none specified	n.a. (under a TAC)	No stock assessment. Some recent changes to harvesting regime and management arrangements.
					none specified	n.a. (under a TAC)	No stock assessment. Some recent changes to harvesting regime and management arrangements. Not subject to overfishing, because there was no take of the species in 2007.
					none specified	n.a. (under a TAC)	No stock assessment. Some recent changes to harvesting regime and management arrangements.
					none specified	n.a.	No stock assessment and little information to assess stock status.
					none specified	n.a.	No stock assessment and little information to assess stock status.
					none specified	n.a.	No stock assessment and little information to assess stock status.
					none specified	n.a. (under a TAC)	No stock assessment and little information to assess stock status.
					biomass	limit $F_{MSY}$ and $B_{MSY}$ (WCPFC)	Little to no fishing in eastern Australia in recent years. Exploited at modest level in western and central Pacific Ocean.
					catch and catch rates	no formal reference points	Little to no fishing in western waters of Australia in recent years. No quantitative assessment for Indian Ocean, but range of indicators do not give cause for concern over status.
					catch	TAC and trigger catch levels	Caution needed—large declines in historical catches of jack mackerel in Zone A (eastern and southern Tasmania) are of concern.
					catch	TAC and trigger catch levels	No stock assessment and little information to assess stock status.
					catch and biomass	TAC and trigger catch levels	Has become the dominant species in the catch. During 2007, the stock was harvested at a sustainable rate determined from an egg survey-derived biomass estimate.
					catch	TAC and trigger catch levels	No stock assessment and little information to assess stock status.
					catch and biomass	TAC and trigger catch levels	Daily egg production method stock assessment completed in 2007.
					catch and biomass	TAC and trigger catch levels	Daily egg production method stock assessment completed in 2007.
					biomass	spatial harvest strategy approach using 'viable' beds	Zero TAC to be set for 3 years from 2006. A survey is needed to examine broad distribution of scallops across the fishery.
					catch	TAC limit	Catch and effort are now negligible. A zero TAC applies indefinitely from 2008.
					none specified	n.a.	Catch and effort are now negligible but caution needed: very long-lived species.

## → STATUS SUMMARY

			STATUS HISTORY <sup>B</sup>										
FISHERY <sup>A</sup>	COMMON NAME	SCIENTIFIC NAME	1992	1993	1994	1996	1997	1998	1999	2000-01	2002-03	2004	2005
South Tasman Rise Trawl Fishery	Spiky oreo	<i>Neocyttus rhomboidalis</i>											
Macquarie Island Fishery	Patagonian toothfish	<i>Dissostichus eleginoides</i>											
Western Deepwater Trawl Fishery	Bugs	<i>Ibacus</i> spp.											
Western Deepwater Trawl Fishery	Ruby snapper	<i>Etelis carbunculus</i>											
Western Deepwater Trawl Fishery	Orange roughy	<i>Hoplostethus atlanticus</i>											
North West Slope Trawl Fishery	Prawns	multiple species											
North West Slope Trawl Fishery	Scampi	<i>Metanephrops australiensis</i> , <i>M. boschmai</i> , <i>M. velutinus</i>											

Not overfished/Not overfishing
  Uncertain
  Overfished/Overfishing
  Not classified

## NOTES

**A** The fisheries and species/groups list does not include fisheries where state/territory government agencies have primary management responsibility: Western Australian Southern Demersal Gillnet and Longline Fishery, Cocos (Keeling) Islands Fishery, Christmas Island Fishery, Northern Shark Fishery and Northern Finfish Fishery.

**B** From 2004 the *Fisheries status reports* have provided both overfishing and overfished status. Those two categories have been combined to illustrate trends in status over time.

**C** The status classifications assigned elsewhere in these *Fishery status reports*.

n.a. not applicable

B<sub>0</sub> mean equilibrium unfished biomass

CPUE catch per unit effort

ETBF Eastern Tuna and Billfish Fishery

F fishing mortality

M natural mortality

MEY maximum economic yield

MSY maximum sustainable yield

NPF Northern Prawn Fishery

SESSF Southern and Eastern Scalefish and Shark Fishery

TAC total allowable catch

Tiers 1-4 SESSF assessment and harvest control rule system

WCPFC Western and Central Pacific Fisheries Commission

	2006 STATUS <sup>c</sup>		2007 STATUS <sup>c</sup>		STOCK STATUS INDICATOR	REFERENCE POINT (TARGET, LIMIT)	COMMENT
	OVERFISHING	OVERFISHED	OVERFISHING	OVERFISHED			
					none specified	n.a.	Catch and effort are now negligible but caution needed: very long-lived species.
					biomass	biomass limits	Stock not overfished and current catches are under a harvest strategy that does not constitute overfishing. Uncertainty about complex stock structure.
					none specified	n.a.	Little effort during 2006–07, with zero landed catch. No assessment.
					none specified	n.a.	Little effort during 2006–07, with correspondingly low catches. A stock assessment in 2002 was inconclusive.
					none specified	n.a.	Not targeted during 2006–07, and zero landed catch. No assessment.
					none specified	n.a.	Small prawn catch in 2006–07, with effort targetting scampi. No stock assessment.
					none specified	n.a.	Sustained effort and catch rates (slightly higher than 2005–06). 2004–05 assessment not comprehensive.

## Australian and Commonwealth fisheries production

Despite the large area of the Australian Fishing Zone—the world’s third largest—Australia ranks only around 50th in world fisheries catch (measured as tonnes of fish landed). Total Australian fisheries production from wild capture and aquaculture was 240 000 tonnes in 2006–07. However, many of the fisheries target high-value species, such as lobsters, prawns, abalone and tuna. The gross value of production of Australia’s fisheries was \$2.18 billion in 2006–07. Compared with 2005–06, this was a 2% increase in nominal terms but a 1% decrease in real terms (adjusted for inflation). Aquaculture accounted for some 36% of the total value and was the main area of growth in gross value of production.

Commonwealth-managed fisheries produced 72 000 tonnes (valued at \$293 million) in 2006–07 (up from \$278 million in 2005–06). This value includes the landed value of southern bluefin tuna input to South Australian ‘tuna farms’ but not the subsequent value added by farm-fattening. The Northern Prawn, Southern Bluefin Tuna, Eastern Tuna and Billfish, and Southern and Eastern Scalefish and Shark Fisheries provide more than 65% of that value.

For the most recent compilations of catch statistics for Australian fisheries, see the annual *Australian fisheries statistics* publication of the Australian Bureau of Agricultural and Resource Economics.

## Notes on structure and content

*Fishery status reports 2007* presents status reports of the primary stocks in every Commonwealth-managed fishery. Each chapter reports on one fishery. The chapters are generally structured in the following way:

- **Main features**—summary information on the fishery and stocks
- **Highlights**—recent events and changes relating to the fishery, its management and the status of stocks
- **Background**—background and history of the fishery and basic biological information on the target stocks
- **The 2007 fishery**—an update on the fishery’s operations during 2007
- **Harvest strategy**—a brief description of the harvest strategy, if any, in place for the fishery
- **Status of stocks**—a discussion of stock assessment results (if any) and other evidence for determining the status of stocks
- **Environmental issues**—a description and discussion of the fishery’s impacts on non-target stocks (including bycatch and threatened, endangered or protected species) and the fishery’s accreditation under environment legislation
- **Further reading**—a brief list of material for further information (not intended to be an exhaustive list of source material)
- **Management performance**—a discussion of management performance relative to legislative and fishery objectives.

Where relevant, each chapter also includes the following information:

- The status of each target stock.
- A map showing the location of the fishery, management boundaries and the sites of fishing activity in recent years.

- Annual fishing effort and associated trends over time. Effort was calculated for the main fishing gears on all vessels in each Commonwealth-managed fishery. Effort data were obtained from AFMA catch-and-effort logbooks, except where other sources are given.
- Annual catches and trends over time. Annual catches are retained catches only and do not include discards, except where indicated. Catch was calculated for every primary-target stock in every Commonwealth-managed fishery. Catch data were obtained from AFMA catch-and-effort logbooks, except where other sources are given. Confidentiality requirements prevent the publication of catch or effort figures derived from fewer than five boats.
- The TAC is noted for comparison with the actual catch. In the SESSF Commonwealth trawl and scalefish-hook sectors, the ‘agreed’ TAC refers to the TAC set by AFMA, while the ‘actual’ TAC refers to the allocated annual quota, which may include carry-over, carry-under or leases between sectors (for example, trawl and non-trawl).
- Annual catch rates are used as quasi-abundance indices (‘quasi’ because they are not standardised and reflect fishing and environmental biases and so might incorrectly reflect trends in abundance). Unless otherwise indicated, catch rates were calculated from AFMA logbook data as catch per unit effort, but only where the shot caught the primary-target stock.