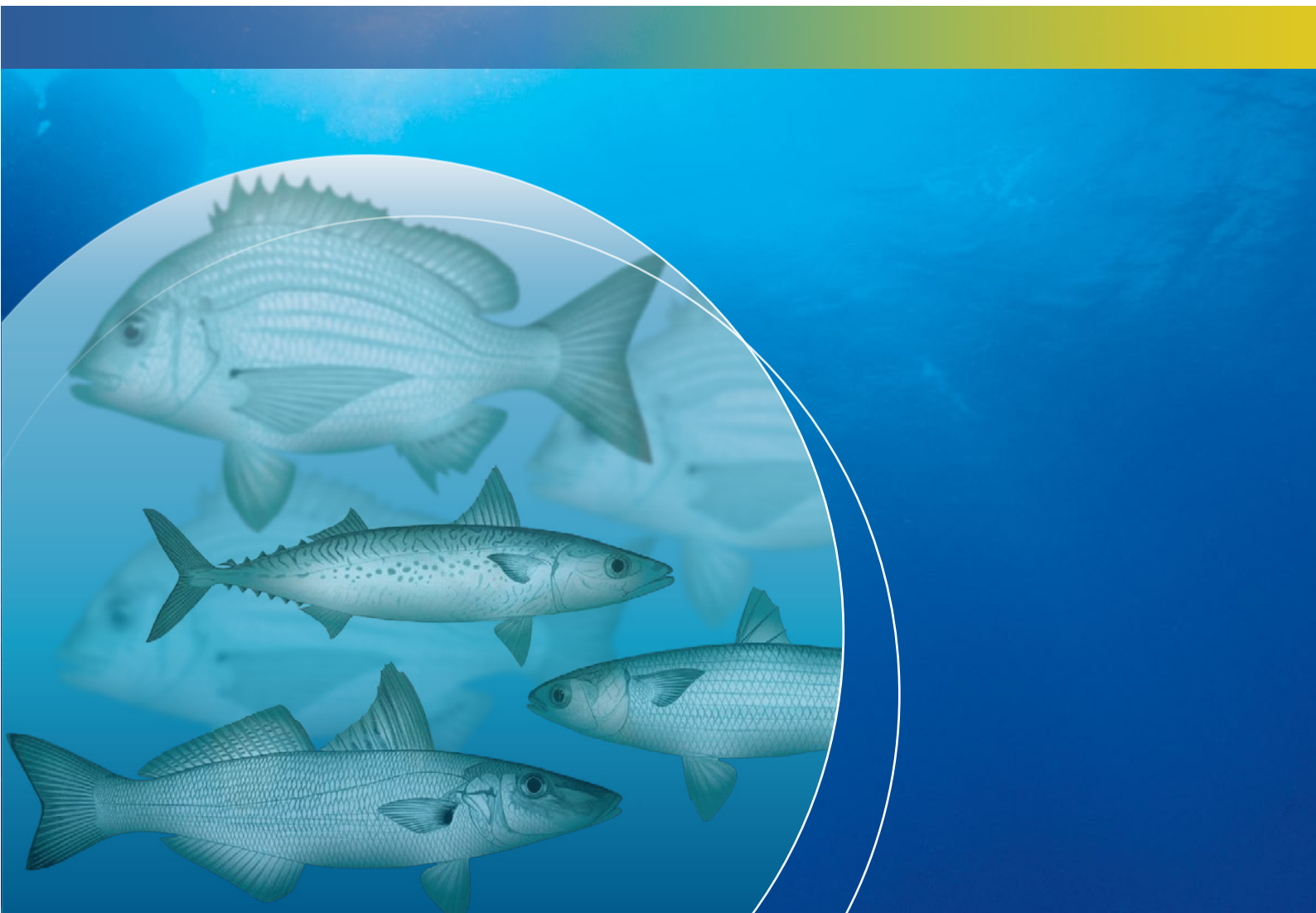




Department of
Primary Industries

Status of fisheries resources in NSW 2011–12

Summary



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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (May 2014). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

Background

Scientists from Fisheries NSW assess the stock status of most exploited marine species annually. The Resource Assessment Workshop for 2013 assessed the available data from 2011–12 for all 114 species that are currently listed in the Department's Resource Assessment System. The outcomes from the workshop included the formal assignment of an exploitation status for each species as well as a Resource Assessment Class (RAC) that indicates the level of assessment performed¹. Note that each species has a designated Target RAC that indicates the level of assessment ideally required based on that species relative importance to fisheries.

The Exploitation Status and RAC categories used by Fisheries NSW to assess exploited marine species are described below.

Stock exploitation categories

Category	Characteristic
Overfished	<ul style="list-style-type: none"> Recruitment is being significantly suppressed as a result of a small spawning biomass (as determined by a population model or measured stock-recruitment relationship). Fishing mortality rates are significantly greater than natural mortality rates. Estimates of spawning biomass are less than 20–30% of the estimated unfished spawning stock. The 'Spawning Potential Ratio' is less than 20–40% (depending on life history characteristics). Catch rates are less than 30% of the initial catch rates. Length and age distributions unstable (excessively affected by recruitment, too few age or size classes in the exploitable population given a species' life history). Trends in length/age compositions are evident which indicate increasing (and/or excessive) fishing mortality.
Growth overfished	<ul style="list-style-type: none"> Yield per recruit would increase if length at first capture was increased or fishing mortality decreased. A population model has determined that sustainable yield would increase if fishing mortality was decreased or size at first capture were increased.
Fully fished	<ul style="list-style-type: none"> Fishing mortality is approximately the same as Natural mortality. Estimates of the spawning biomass are greater than 30% of the estimated unfished spawning biomass. Catch rates have been steady for 5–10 years and/or catch rates are greater than 30% of initial catch rates. Length and age distributions are stable. Species are fished throughout their entire geographic range.
Moderately fished	<ul style="list-style-type: none"> Fishing mortality is less than half of natural mortality. Estimates of the biomass are greater than 70% of the estimated unfished biomass. Catch rates are greater than 70% of initial catch rates. Species are fished in most of their geographic range but non-fishing areas are known to exist. Markets may limit catch and effort.
Uncertain	<ul style="list-style-type: none"> A significant amount of evidence has been collected and considered, but there are inconsistent or contradictory signals in the data that preclude determination of exploitation status.
Undefined	<ul style="list-style-type: none"> Commercial catch data are available but no reasonable attempt has been made to determine exploitation status. Recreational species – some data are available but no reasonable attempt has been made to determine exploitation status.

¹ Further details on the NSW resource assessment framework can be found in Scandol 2004 at www.dpi.nsw.gov.au/research/areas/fisheries-and-ecosystems/wild-fisheries/outputs/2004/382

Resource assessment class definitions

Attribute	Class of assessment				
	One	Two	Three	Four	Five
Current population dynamic models producing estimates of relative biomass	class one				
Estimates of biological reference points (e.g. SPR, YPR, F0.1)		class two			
Current estimates of total, natural and fishing mortality		class two			
Time series of age composition data (finfish only)		class two			
Current local (NSW) information for growth, mortality, selectivity and maturity		class two			
Current qualitative risk analysis of future harvesting		class two			
Current indicator of abundance			class three		
Representative time-series of commercial catch			class three		
Current estimate of recreational catch			class three		
Time series of length-composition data			class three		
Current non-local (not NSW) information for growth, mortality, selectivity and maturity				class four	
Known biological stock structure				class four	
Complex of related species					class five

Key outputs from the 2013 workshop

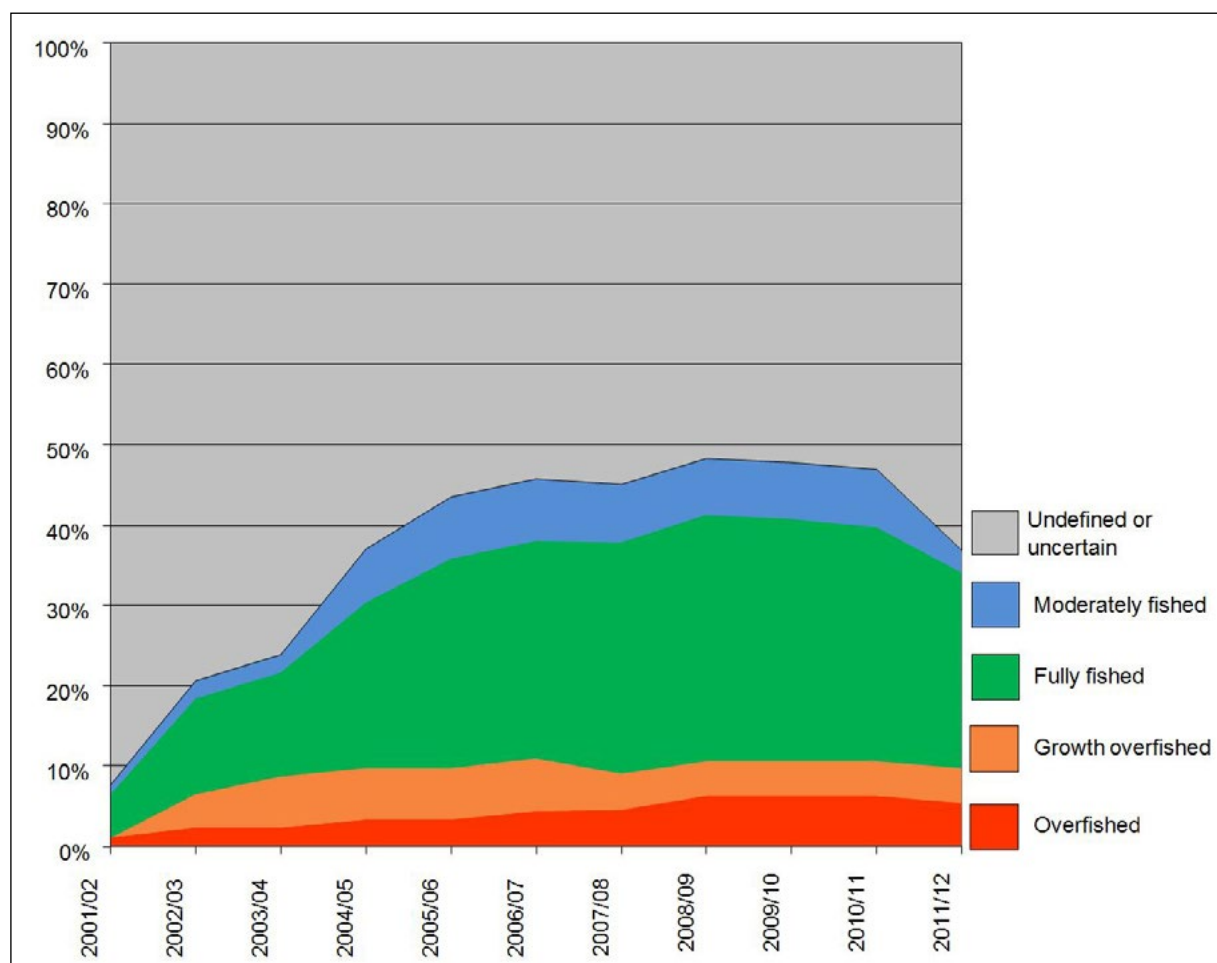
Exploitation status

- Eighteen species had their exploitation status changed for the 2011–12 year (Table 1).
- The dogfish species complex was moved from an Undefined status to an Overfished status based on the Commonwealth's assessment for this complex.
- Jackass Morwong were moved from an Overfished status to a Fully Fished status, again based on the Commonwealth's assessment for this species.
- Blacklip Abalone were moved from an Overfished status to an Uncertain status due to conflicting trends in the datasets used as well as a lack of data on abalone sizes being available from the commercial industry.
- Stout Whiting were moved from Moderately Fished to Fully Fished and the remaining 14 species were changed to either Uncertain or Undefined exploitation statuses, generally due to a lack of recent data on which to adequately assess the current status of their stocks.
- There are currently six Overfished and five Growth Overfished species in NSW. Twenty eight species are Fully Fished, three species are Moderately fished and 72 species are either Undefined or Uncertain (Figure 1).

Table 1. Summary of changes to exploitation status for species assessed at the 2013 Resource Assessment Workshop.

Species	2010–11 exploitation status	2011–12 exploitation status
Australian Sardine	Fully Fished	Uncertain
Blacklip Abalone	Overfished	Uncertain
Common Silverbiddy	Moderately Fished	Uncertain
Crimsonband Wrasse	Moderately Fished	Uncertain
Cunjevoi	Moderately Fished	Undefined
Dogfish	Undefined	Overfished
Ghost Nipper	Moderately Fished	Undefined
Giant Mud Crab	Undefined	Uncertain
Goldspot Mullet	Moderately Fished	Uncertain
Jackass Morwong	Overfished	Fully Fished
Ocean Perch	Fully Fished	Uncertain
Pearl Perch	Fully Fished	Uncertain
River Garfish	Fully Fished	Uncertain
Silver Sweep	Fully Fished	Uncertain
Stout Whiting	Moderately Fished	Fully Fished
Striped Marlin	Undefined	Uncertain
Tarwhine	Fully Fished	Uncertain
Teraglin	Fully Fished	Uncertain

Figure 1. Summary of exploitation status for species assessed by Fisheries NSW since 2001–02.



Resource Assessment Class

Eleven species had their Resource Assessment Classes (RACs) changed for the 2011–12 year (Table 2). Eastern King Prawns had their RAC increased from a 2 to a 1 to reflect the current population model developed by NSW and Queensland scientists. The remaining 10 species all had their RACs decreased to reflect a lack of recent data available for use in their assessments.

Table 2. Summary of changes to Resource Assessment Class (RAC) for species assessed at the 2013 Resource Assessment Workshop.

Species	2010–11 RAC	2011–12 RAC
Australian Sardine	2	3
Catfish	4	5
Crimsonband Wrasse	2	3
Eastern Australian Salmon	2	3
Eastern King Prawn	2	1
Ghost Nipper	3	4
Leatherjackets	4	5
Ocean Jackets	2	3
Silver Trevally	2	3
Tailor	1	3
Tarwhine	2	3

Table 3. Exploitation status and Assessment class for all species listed in the Fisheries NSW Resource Assessment System for 2011–12. An assessment class shaded green denotes that the level of understanding about this species is at or above the target level. Assessment classes shaded red are below the target level.

Species	Stock Status					
	2009–10		2010–11		2011–12	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Angel Sharks (<i>Squatina</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
Australian Anchovy (<i>Engraulis australis</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Australian Bonito (<i>Sarda australis</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished
Australian Sardine (<i>Sardinops sagax</i>)	Two	Fully Fished	Two	Fully Fished	Three	Uncertain
Banded Morwong (<i>Cheilodactylus spectabilis</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Banded Rockcod (<i>Epinephelus ergastularius</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Bass Groper (<i>Polyprion americanus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Beachworms (<i>Onuphidae</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Bigeyes (<i>Priacanthidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Blacklip Abalone (<i>Haliotis rubra</i>)	Three	Overfished	Three	Overfished	Two	Uncertain
Blue Mackerel (<i>Scomber australasicus</i>)	Three	Moderately Fished	Three	Moderately Fished	Three	Moderately Fished
Blue Shark (<i>Prionace glauca</i>)	Four	Uncertain	Four	Uncertain	Four	Uncertain
Blue Swimmer Crab (<i>Portunus armatus</i>)	Two	Fully Fished	Four	Uncertain	Four	Uncertain
Blue-eye Trevalla (<i>Centrolophidae</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Bluespotted Flathead (<i>Platycephalus caeruleopunctatus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Boarfish (<i>Pentacerotidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Broad Squid (<i>Uroteuthis</i> (<i>Photololigo</i>) <i>etheridgei</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Brown Tiger Prawn (<i>Penaeus esculentus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Bugs (<i>Ibacus</i> spp.)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Catfish (<i>Siluriformes</i>)	Four	Undefined	Four	Undefined	Five	Undefined
Cobia (<i>Rachycentron canadum</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Cockles (<i>Arcoida</i> and <i>Veneroida</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Common Jack Mackerel (<i>Trachurus declivis</i>)	Four	Uncertain	Four	Uncertain	Four	Uncertain
Common Silverbiddy (<i>Gerres subfasciatus</i>)	Four	Moderately Fished	Four	Moderately Fished	Four	Uncertain
Crimsonband Wrasse (<i>Notolabrus gymnogenis</i>)	Two	Moderately Fished	Two	Moderately Fished	Three	Uncertain
Cunjevoi (<i>Pyura stolonifera</i>)	Four	Moderately Fished	Four	Moderately Fished	Four	Undefined
Cuttlefish (<i>Sepia</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
Dart (<i>Trachinotus</i> spp.)	Four	Undefined	Four	Undefined	Four	Undefined
Diamondfish (<i>Monodactylus argenteus</i>)	Four	Undefined	Four	Undefined	Four	Undefined

Species	Stock Status					
	2009–10		2010–11		2011–12	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Dogfish (<i>Squaliformes</i>)	Five	Undefined	Five	Undefined	Five	Overfished
Dusky Flathead (<i>Platycephalus fuscus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Eastern Australian Salmon (<i>Arripis trutta</i>)	Two	Fully Fished	Two	Fully Fished	Three	Fully Fished
Eastern Blue Groper (<i>Achoerodus viridis</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Eastern King Prawn (<i>Melicertus plebejus</i>)	Two	Growth Overfished	Two	Growth Overfished	One	Growth Overfished
Eastern Pigfish (<i>Bodianus unimaculatus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Eastern Red Scorpionfish (<i>Scorpaena cardinalis</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished
Eastern Rock Lobster (<i>Jasus verreauxi</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Eastern School Whiting (<i>Sillago flindersi</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Eastern Sea Garfish (<i>Hyporhamphus australis</i>)	Two	Overfished	Two	Overfished	Two	Overfished
Estuary Perch (<i>Macquaria colonorum</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Flounders (<i>Paralichthyidae</i> and <i>Pleuronectidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Frigate Mackerel (<i>Auxis thazard</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Gemfish (<i>Rexea solandri</i>)	One	Overfished	One	Overfished	One	Overfished
Ghost Nipper (<i>Trypaea australiensis</i>)	Three	Moderately Fished	Three	Moderately Fished	Four	Undefined
Ghostsharks (<i>Chimaeriformes</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Giant Mud Crab (<i>Scylla serrata</i>)	Three	Undefined	Three	Undefined	Three	Uncertain
Goatfish (<i>Mullidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Goldspot Mullet (<i>Liza argentea</i>)	Three	Moderately Fished	Three	Moderately Fished	Three	Uncertain
Greentail Prawn (<i>Metapenaeus bennettiae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Grey Morwong (<i>Nemadactylus douglasii</i>)	Two	Overfished	Two	Overfished	Two	Overfished
Gummy Shark (<i>Mustelus antarcticus</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Hairtail (<i>Trichiurus lepturus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Hammerhead Sharks (<i>Sphyrna</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
Hapuku (<i>Polyprion oxygeneios</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Jackass Morwong (<i>Nemadactylus macropterus</i>)	One	Overfished	One	Overfished	One	Fully Fished
John Dory (<i>Zeus faber</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Leatherjackets – other (<i>Monacanthidae</i>)	Four	Fully Fished	Four	Fully Fished	Five	Undefined
Longtail Tuna (<i>Thunnus tonggol</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Luderick (<i>Girella tricuspidata</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished

Species	Stock Status					
	2009–10		2010–11		2011–12	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Mackerel Tuna (<i>Euthynnus affinis</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Mahi Mahi (<i>Coryphaena hippurus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Mako Sharks (<i>Isurus</i> spp.)	Four	Undefined	Four	Undefined	Four	Undefined
Mangrove Jack (<i>Lutjanus argentimaculatus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Mantis Shrimps (Stomatopoda)	Four	Undefined	Four	Undefined	Four	Undefined
Mirror Dory (<i>Zenopsis nebulosus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Mulloway (<i>Argyrosomus japonicus</i>)	Two	Overfished	Three	Overfished	Three	Overfished
Ocean Jackets (<i>Nelusetta ayraudi</i>)	Two	Undefined	Two	Undefined	Three	Fully Fished
Ocean Perch (<i>Sebastidae</i>)	Three	Fully Fished	Three	Fully Fished	Three	Uncertain
Ocean Trawl Squid (<i>Teuthida</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Octopus (<i>Octopus</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
Pearl Perch (<i>Glaucosoma scapulare</i>)	Two	Fully Fished	Two	Fully Fished	Two	Uncertain
Pipi (<i>Donax deltoides</i>)	Three	Uncertain	Three	Uncertain	Three	Uncertain
Red Gurnard and Latchets (<i>Triglidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Red Morwong (<i>Cheilodactylus fuscus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Redfish (<i>Centroberyx affinis</i>)	Three	Growth Overfished	Three	Growth Overfished	Three	Growth Overfished
River Eels (<i>Anguilla</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
River Garfish (<i>Hyporhamphus regularis ardelio</i>)	Three	Fully Fished	Three	Fully Fished	Three	Uncertain
Rock Blackfish (<i>Girella elevata</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Royal Red Prawn (<i>Haliporoides sibogae</i>)	Three	Moderately Fished	Three	Moderately Fished	Three	Moderately Fished
Sand Mullet (<i>Myxus elongatus</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Sand Whiting (<i>Sillago ciliata</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Sawsharks (<i>Pristiophorus</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
School Prawn (<i>Metapenaeus macleayi</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
School Shark (<i>Galeorhinus galeus</i>)	One	Overfished	One	Overfished	One	Overfished
Sea Mullet (<i>Mugil cephalus</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished
Sea Urchins (<i>Heliocidaris tuberculata</i> , <i>H. erythrogramma</i> and <i>Centrostephanus rodgersii</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Shovelnose Rays (<i>Rajiformes</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Silver Sweep (<i>Scorpius lineolatus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Uncertain

Species	Stock Status					
	2009–10		2010–11		2011–12	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Silver Trevally (<i>Pseudocaranx georgianus</i>)	Two	Growth Overfished	Two	Growth Overfished	Three	Growth Overfished
Snapper (<i>Pagrus auratus</i>)	Two	Growth Overfished	Two	Growth Overfished	Two	Growth Overfished
Soles (<i>Soleidae</i> and <i>Cynoglossidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Southern Calamari (<i>Sepioteuthis australis</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Southern Maori Wrasse (<i>Ophthalmolepis lineolatus</i>)	Two	Moderately Fished	Two	Moderately Fished	Two	Moderately Fished
Spanish Mackerel (<i>Scomberomorus commerson</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Spanner Crab (<i>Ranina ranina</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished
Spotted Mackerel (<i>Scomberomorus munroi</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Stout Whiting (<i>Sillago robusta</i>)	Two	Moderately Fished	Two	Moderately Fished	Two	Fully Fished
Striped Grunters (<i>Terapontidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Striped Marlin (<i>Tetrapturus audax</i>)	Two	Undefined	Two	Undefined	Two	Uncertain
Tailor (<i>Pomatomus saltatrix</i>)	One	Fully Fished	One	Fully Fished	Three	Fully Fished
Tarwhine (<i>Rhabdosargus sarba</i>)	Two	Fully Fished	Two	Fully Fished	Three	Uncertain
Teraglin (<i>Atractoscion aequidens</i>)	Three	Fully Fished	Three	Fully Fished	Three	Uncertain
Tiger Flathead (<i>Neoplatycephalus richardsoni</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Tiger Shark (<i>Galeocerdo cuvier</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Tilefish (<i>Branchiostegus</i> spp.)	Three	Undefined	Three	Undefined	Three	Undefined
Trumpeter Whiting (<i>Sillago maculata</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Turban Shells (<i>Turbo torquatus</i> , <i>Turbo imperialis</i> , <i>Turbo undulatus</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Whaler Sharks (<i>Carcharhinus</i> spp.)	Five	Undefined	Five	Undefined	Five	Undefined
Whitebait – Sandy Sprat (<i>Hyperlophus vittatus</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Wobbegong Sharks (<i>Orectolobus</i> spp.)	Three	Undefined	Three	Undefined	Three	Undefined
Yellowfin Bream (<i>Acanthopagrus australis</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Yellowfin Tuna (<i>Thunnus albacares</i>)	One	Fully Fished	One	Fully Fished	One	Fully Fished
Yellowtail Kingfish (<i>Seriola lalandi</i>)	Two	Growth Overfished	Two	Growth Overfished	Two	Growth Overfished
Yellowtail Scad (<i>Trachurus novaezelandiae</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished