



Department of
Primary Industries

Status of fisheries resources in NSW 2012–13

Summary



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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (December 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 DPI Fisheries assess the stock status of most exploited marine species annually. The Resource Assessment Workshop (RAW) for 2014 assessed the available data from 2012/13 for all 115 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 DPI Fisheries 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	One				
Estimates of biological reference points (e.g. SPR, YPR, F0.1)		Two			
Current estimates of total, natural and fishing mortality		Two			
Time series of age composition data (finfish only)		Two			
Current local (NSW) information for growth, mortality, selectivity and maturity					
Current qualitative risk analysis of future harvesting		Two			
Current indicator of abundance			Three		
Representative time-series of commercial catch			Three		
Current estimate of recreational catch			Three		
Time series of length-composition data			Three		
Current non-local (not NSW) information for growth, mortality, selectivity and maturity				Four	
Known biological stock structure				Four	
Complex of related species					Five

Key outputs from the 2014 workshop

Exploitation Status

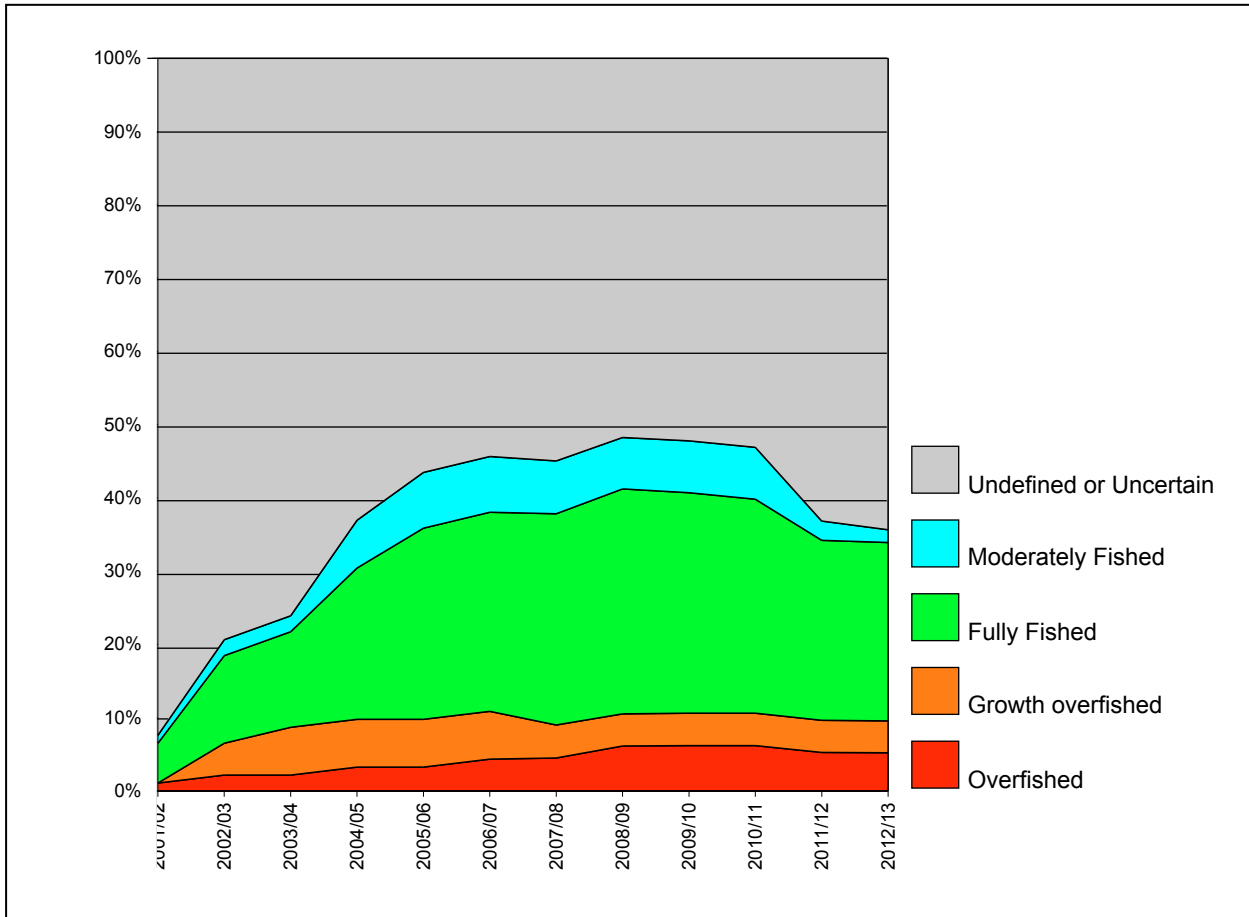
Four species had their exploitation status changed for the 2012/13 year (Table 1). The Ocean perch species complex was moved from Uncertain to Fully Fished based on an updated assessment by the Commonwealth that assessed both Bigeye and Reef Ocean perch as not subject to overfishing and not overfished in 2013. Pink ling was considered for the first time in the NSW RAW process and was assessed as having an Uncertain stock status. This status was based on uncertainties around the stock structure of Pink ling and the reported estimates of biomass spanning the NSW exploitation status characteristics of Fully Fished and Overfished. Dusky flathead was moved from a Fully Fished status to an Uncertain status due to inconsistent signals in the data, including a 30% drop in commercial catch in 2012/13, stable catch rates and recent age composition data suggesting excessive fishing mortality. Southern Maori Wrasse was changed from being Fully Fished to Undefined to reflect the outdated previous assessment and the inability to assess stock status based purely on the very small commercial fishery for this species.

There are currently 6 Overfished and 5 Growth Overfished species in NSW. Twenty eight species are Fully Fished, 2 species are Moderately Fished and 74 species are either Undefined or Uncertain (Figure 1).

Table 1. Summary of changes to Exploitation Status for species assessed at the 2014 Resource Assessment Workshop.

Species	2011–12 Exploitation status	2012–13 Exploitation status
Ocean Perch	Uncertain	Fully Fished
Pink Ling	New species for NSW assessment	Uncertain
Dusky Flathead	Fully Fished	Uncertain
Southern Maori Wrasse	Moderately Fished	Undefined

Figure 1. Summary of Exploitation Status for species assessed by DPI Fisheries since 2001–02.



Resource Assessment Class

Eight species had their Resource Assessment Classes (RACs) changed for the 2012–13 year (Table 2). Pink ling was assigned a RAC of 1 to reflect the Commonwealth's population model for this species. Sea urchins had their RAC increased from 5 to 3 to reflect the ability to accurately separate this species complex. Pearl Perch, School Prawns and Southern Maori Wrasse had their RACs reduced to reflect the lack of current data for assessment. Mantis Shrimps, Broad Squid and Flounders were reduced to RACs of 5 to reflect the current inability to separate species within these complexes for assessment purposes.

Currently 40 species of the 115 assessed have RACs at their target levels or above

Table 2. Summary of changes to Resource Assessment Class (RAC) for species assessed at the 2014 Resource Assessment Workshop.

Species	2011–12 RAC	2012–13 RAC
Pink Ling	New species for NSW assessment	1
Pearl Perch	2	3
School Prawn	1	3
Southern Maori Wrasse	2	4
Mantis Shrimps	4	5
Broad Squid	3	5
Flounders	4	5
Sea Urchins	5	3

Table 3. Exploitation status and Assessment class for all species listed in the DPI Fisheries Resource Assessment System for 2012–13. 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. N/A denotes that the species was not assessed in that year.

Species	Stock Status					
	2010-11		2011-12		2012-13	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Angel Sharks (<i>Squatina spp.</i>)	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	Three	Uncertain	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	Uncertain	Three	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>)	Four	Uncertain	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 (Photololigo) etheridgei</i>)	Three	Undefined	Three	Undefined	Five	Undefined
Brown Tiger Prawn (<i>Penaeus esculentus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Bugs (<i>Ibacus spp.</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Catfish (<i>Siluriformes</i>)	Four	Undefined	Five	Undefined	Five	Undefined
Cobia (<i>Rachycentron canadum</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Cockles (<i>Arcoida and 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	Uncertain	Four	Uncertain
Crimsonband Wrasse (<i>Notolabrus gymnogenis</i>)	Two	Moderately Fished	Three	Uncertain	Three	Uncertain
Cunjevoi (<i>Pyura stolonifera</i>)	Four	Moderately Fished	Four	Undefined	Four	Undefined
Cuttlefish (<i>Sepia spp.</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Dart (<i>Trachinotus spp.</i>)	Four	Undefined	Four	Undefined	Four	Undefined

Species	Stock Status					
	2010-11		2011-12		2012-13	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Diamondfish (<i>Monodactylus argenteus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Dogfish (<i>Squaliformes</i>)	Five	Undefined	Five	Overfished	Five	Overfished
Dusky Flathead (<i>Platycephalus fuscus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Uncertain
Eastern Australian Salmon (<i>Arripis trutta</i>)	Two	Fully Fished	Three	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	One	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>Sagmariasus 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	Five	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	Four	Undefined	Four	Undefined
Ghostsharks (<i>Chimaeriformes</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Giant Mud Crab (<i>Scylla serrata</i>)	Three	Undefined	Three	Uncertain	Three	Uncertain
Goatfish (<i>Mullidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Goldspot Mullet (<i>Liza argentea</i>)	Three	Moderately Fished	Three	Uncertain	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 spp.</i>)	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	Fully Fished	One	Fully Fished
John Dory (<i>Zeus faber</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Leatherjackets-other (<i>Monacanthidae</i>)	N/A	N/A	Five	Undefined	Five	Undefined
Longtail Tuna (<i>Thunnus tonggol</i>)	Four	Undefined	Four	Undefined	Four	Undefined

Species	Stock Status					
	2010-11		2011-12		2012-13	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Luderick (<i>Girella tricuspidata</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
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 spp.</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Mangrove Jack (<i>Lutjanus argentimaculatus</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Mantis Shrimps (<i>Stomatopoda</i>)	Four	Undefined	Four	Undefined	Five	Undefined
Mirror Dory (<i>Zenopsis nebulosus</i>)	Three	Fully Fished	Three	Fully Fished	Three	Fully Fished
Mulloway (<i>Argyrosomus japonicus</i>)	Three	Overfished	Three	Overfished	Three	Overfished
Ocean Jackets (<i>Nelusetta ayraudi</i>)	Two	Fully Fished	Three	Fully Fished	Three	Fully Fished
Ocean Perch (<i>Sebastidae</i>)	Three	Fully Fished	Three	Uncertain	Three	Fully Fished
Ocean Trawl Squid (<i>Teuthida</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Octopus (<i>Octopus spp.</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Pearl Perch (<i>Glaucosoma scapulare</i>)	Two	Fully Fished	Two	Uncertain	Three	Uncertain
Pink Ling (<i>Genypterus blacodes</i>)	N/A	N/A	N/A	N/A	One	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 spp.</i>)	Five	Undefined	Five	Undefined	Five	Undefined
River Garfish (<i>Hyporhamphus regularis ardelio</i>)	Three	Fully Fished	Three	Uncertain	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 spp.</i>)	Five	Undefined	Five	Undefined	Five	Undefined
School Prawn (<i>Metapenaeus macleayi</i>)	One	Fully Fished	One	Fully Fished	Three	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 rogersii</i>)	Five	Undefined	Five	Undefined	Three	Undefined
Shovelnose Rays (<i>Rajiformes</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Silver Sweep (<i>Scorpius lineolatus</i>)	Three	Fully Fished	Three	Uncertain	Three	Uncertain

Species	Stock Status					
	2010-11		2011-12		2012-13	
	RAC	Exploitation Status	RAC	Exploitation Status	RAC	Exploitation Status
Silver Trevally (<i>Pseudocaranx georgianus</i>)	Two	Growth Overfished	Three	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	Four	Undefined
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	Fully Fished	Two	Fully Fished
Striped Grunters (<i>Terapontidae</i>)	Four	Undefined	Four	Undefined	Four	Undefined
Striped Marlin (<i>Tetrapturus audax</i>)	Two	Undefined	Two	Uncertain	Two	Uncertain
Tailor (<i>Pomatomus saltatrix</i>)	One	Fully Fished	Three	Fully Fished	Three	Fully Fished
Tarwhine (<i>Rhabdosargus sarba</i>)	Two	Fully Fished	Three	Uncertain	Three	Uncertain
Teraglin (<i>Atractoscion aequidens</i>)	Three	Fully Fished	Three	Uncertain	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 spp.</i>)	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 spp.</i>)	Five	Undefined	Five	Undefined	Five	Undefined
Whitebait - Sandy Sprat (<i>Hyperlophus vittatus</i>)	Three	Undefined	Three	Undefined	Three	Undefined
Wobbeong Sharks (<i>Orectolobus spp.</i>)	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	Three	Growth Overfished
Yellowtail Scad (<i>Trachurus novaezelandiae</i>)	Two	Fully Fished	Two	Fully Fished	Two	Fully Fished