

Summary of Key Species

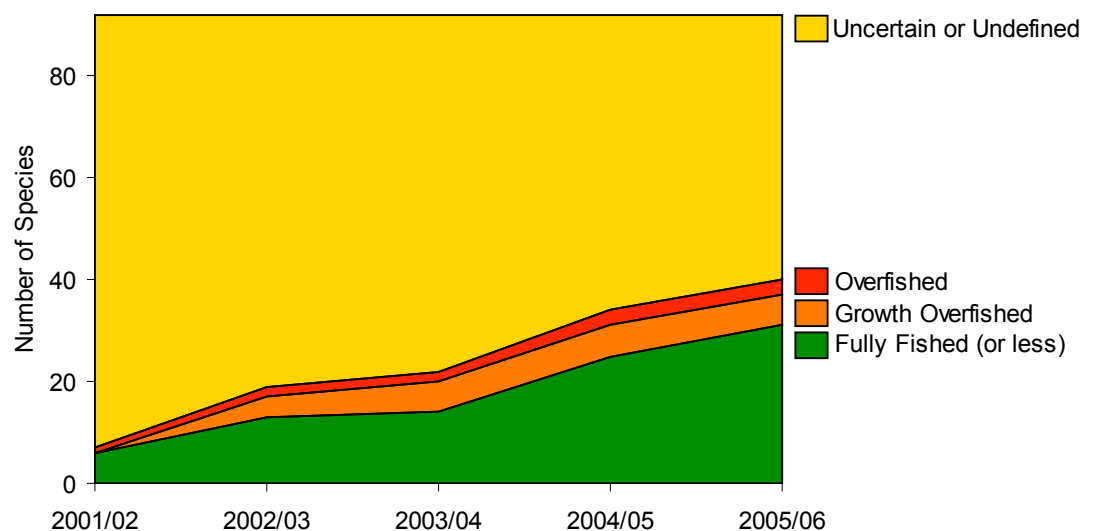
This report presents information from all of the key species from the Estuary General, Estuary Prawn Trawl, Ocean Hauling, Ocean Trawl and Ocean Trap and Line Fisheries. These five multi-species fisheries have regulatory reporting requirements for resource assessment which can be treated concurrently. Reports specific to each fishery will be compiled and presented separately. Note that this report does not include any commentary on species within the NSW Abalone Fishery, Rock Lobster Fishery, Inland Fishery or the Sea Urchin and Turban Shell Fishery.

Exploitation Status of Key Species

Since 2001/02 there has been a steady decrease in the number of key species which are considered to have an exploitation status which is uncertain or undefined. Most of these additional assessments have determined species to be fully fished (and, in some cases, moderately or lightly fished). Three species are considered to be overfished (gemfish, eastern sea garfish and mulloway). Gemfish are considered to be recruitment overfished because of extensive population modelling undertaken by Commonwealth research and management agencies. All three of these overfished species have a regulatory requirement for a recovery program to be put in place. Six species are considered to be growth overfished including eastern king prawn, redfish, school prawn, silver trevally, snapper and yellowtail kingfish. Growth overfishing does not necessarily indicate that the fishery is unsustainable, rather that harvesting is economically inefficient and that management involves greater risks and costs of monitoring.

For many key species that are considered “undefined”, there exists significant reporting issues that will be difficult to resolve without independent observer programs. The observer project currently underway in the Ocean Trap and Line Fishery is monitoring the catches from line fishing and this project will provide valuable insights into the composition of harvested sharks. Similar programs will need to be undertaken for other fishing methods.

Exploitation Status of Key Species



Summary of the exploitation status of all key species from the Estuary General, Estuary Prawn Trawl, Ocean Hauling, Ocean Trawl and Ocean Trap and Line Fisheries from 2001/02 to 2005/06. Note that the species considered Overfished and Recruitment Overfished are combined and labelled as “Overfished”, and that the species considered Uncertain and Undefined have been combined on this figure.

SPECIES	STATUS	HARVEST COMMENT	PAGE
Angel Sharks <i>Squatina</i> spp.	Undefined	No detailed stock assessment is available for the two species harvested. Species identification issues exist, but both species are likely to be relatively fast growing and reasonably fecund (although the biology has not been studied in detail).	1
Australian Anchovy <i>Engraulis australis</i>	Undefined	No detailed stock assessment available. Likely to be a fast growing species with limited concerns for overfishing.	5
Australian Salmon <i>Arripis trutta</i>	Undefined	No detailed stock assessment available. Anecdotal evidence suggests the stocks are not heavily fished. NSW DPI has recently commenced a research project (Australian salmon (<i>Arripis trutta</i>): Population structure, reproduction, diet and composition of commercial and recreational catches in NSW) which will provide key biological information on this species.	7
Australian Sardine <i>Sardinops neopilchardus</i>	Moderately Fished	Results of retrospective biomass estimate based upon the daily egg production method indicates a spawning biomass of between 9000-60 000 t, with the most probable estimate between 25 000-35 000 t (Ward et al., submitted).	11
Banded Rockcod <i>Epinephelus ergastularius</i>	Undefined	Small seasonal fishery in NSW. Little information is available on the biology of the species.	15
Bass Groper <i>Polyprion americanus</i>	Undefined	No detailed stock assessment available. Species has a worldwide distribution, local status is undefined.	19
Beachworms Onuphidae	Undefined	No detailed stock assessment available. Composition of species harvested is unclear. No precise estimate of recreational catch, which might be significant in particular areas.	23
Bigeyes Priacanthidae	Undefined	Taken as a bycatch in the Estuary Prawn Trawl and Ocean Trawl Fisheries and is also caught by the recreational sector.	27
Blue Mackerel <i>Scomber australasicus</i>	Moderately Fished	Overall the stock off NSW is believed to be moderately fished, but there may be localised depletions.	29
Blue Swimmer Crab <i>Portunus pelagicus</i>	Fully Fished	An important recreational and commercial species. Biological data collected for Wallis Lake indicate high fishing pressure in this estuary. Some concerns exist about the offshore catch of female crabs.	33
Blue-eye Trevalla Centrolophidae	Moderately Fished	Decline in catch along with effort has resulted in a stable catch per unit effort. The species does not appear to be under high fishing pressure from fisheries operating in NSW waters.	37
Bluespotted Flathead <i>Platycephalus caeruleopunctatus</i>	Fully Fished	Important commercial and recreational species. Minimal research has been completed on this species. Better biological information will be available in 2008.	41
Boarfish Pentacerotidae	Undefined	No detailed stock assessment available. Incidental catch in the Ocean Trawl Fishery.	45

SPECIES	STATUS	HARVEST COMMENT	PAGE
Bonito <i>Sarda</i> spp.	Undefined	Biological and length data have been collected within the monitoring program. Analysis of length frequency data indicates rapid individual growth.	47
Brown Tiger Prawn <i>Penaeus esculentus</i>	Undefined	NSW is at the southern end of the species range. Recruitment is likely to be small and variable.	51
Bugs <i>Ibacus</i> spp.	Fully Fished	Four species of bugs are marketed in NSW; two species dominate commercial landings. Species identification issues remain within the commercial catch, but length composition and catch rates are stable.	55
Catfish Siluriformes	Undefined	Several species of catfishes are harvested at low levels in NSW estuaries by both commercial and recreational fishers.	59
Cockles Arcoida and Veneroida	Undefined	No detailed stock assessment available for any of the cockle or clam species harvested and reported within this group. Only basic biological data are available.	63
Common Jack Mackerel <i>Trachurus declivis</i>	Uncertain	Predominantly a Commonwealth fishery with very few operators.	67
Common Silverbiddy <i>Gerres subfasciatus</i>	Moderately Fished	There has been a significant reduction in commercial fishing pressure due to the introduction of Recreational Fishing Havens.	69
Cuttlefish <i>Sepia</i> spp.	Uncertain	Species composition issues will restrict our ability to assess these stocks. All species in this group are likely to exhibit rapid growth and have a short live span.	71
Dart <i>Trachinotus</i> spp.	Undefined	No detailed stock assessment available. Queensland study indicated that spawning potential ratio would increase if the minimum legal length was increased.	75
Diamondfish <i>Monodactylus argenteus</i>	Undefined	Mainly an estuary fish found around wharfs and rocky headlands. No detailed assessment likely to be completed.	77
Dogfish Squaliformes	Undefined	Species identification issues are significant. One species, <i>Squalus megalops</i> , is still relatively abundant off NSW, but there are very serious conservation issues for all other dogfish species.	79
Dusky Flathead <i>Platycephalus fuscus</i>	Fully Fished	Commercial catch rates are steady, but the species is primarily harvested by recreational fishers. More information is required on the recreational fishery. Detailed assessments will need to be at the scale of estuaries.	83
Eastern King Prawn <i>Melicertus plebejus</i>	Growth Overfished	Status continues to be growth overfished as determined by yield-per-recruit modelling. Catch rates are stable in both NSW and Queensland. Strong evidence exists that fishing power in Queensland is increasing.	87
Eastern School Whiting <i>Sillago flindersi</i>	Fully Fished	A significant species in the NSW Ocean Trawl Fishery. In NSW, this small, fast growing fish has stable land ings of around 800-1000 t. The eastern school whiting stock is shared with the Commonwealth.	91

SPECIES	STATUS	HARVEST COMMENT	PAGE
Eastern Sea Garfish <i>Hyporhamphus australis</i>	Overfished	The stock does not appear to be recovering and there is still a lack of older fish (3-4 years) in the population. The commercial fishery is still predominantly based upon one year old fish.	95
Estuary Squid <i>Uroteuthis</i> spp.	Fully Fished	These are fast growing species with a high mortality rate. The Hawkesbury River fishery for <i>Uroteuthis etheridgei</i> is fully fished.	99
Flounders Paralichthyidae and Pleuronectidae	Undefined	Species identification issues need to be resolved, but this issue has relatively low priority.	103
Frigate Mackerel <i>Auxis thazard</i>	Undefined	Minimal information is currently available. May be significant as a recreational species.	107
Gemfish <i>Rexea solandri</i>	Recruitment Overfished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment has been adopted.	109
Ghostsharks Chimaeriformes	Undefined	Few individuals are harvested as bycatch in the Ocean Trawl Fishery from the continental slope.	113
Giant Mud Crab <i>Scylla serrata</i>	Undefined	Could be susceptible to overfishing as NSW is the southern extent of their range, however there are no concerning trends in the fishery data.	115
Goatfish Mullidae	Undefined	No detailed stock assessment available. Low priority for size composition monitoring at Sydney Fish Markets.	119
Goldspot Mullet <i>Liza argentea</i>	Moderately Fished	Species considered to be moderately fished state-wide, but the exploitation status varies between estuaries.	123
Greentail Prawn <i>Metapenaeus bennettiae</i>	Undefined	No detailed stock assessment available. This species is similar to the school prawn, but completes its life cycle wholly within estuaries.	127
Grey Morwong <i>Nemadactylus douglasii</i>	Fully Fished	Long term declines are evident in both landings and catch rates, and the average size of harvested fish has also decreased since the 1970s. Results from research do not, however, indicate a growth overfished stock.	131
Gummy Shark <i>Mustelus antarcticus</i>	Fully Fished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment was adopted.	135
Hairtail Trichiuridae	Undefined	No local biological information available, but the species is widespread throughout the Indo-Pacific area.	139
Hammerhead Sharks <i>Sphyrna</i> spp.	Undefined	Three species of hammerhead shark are harvested by the commercial line fishery and are also targeted by the recreational gamefish fishery.	141
Hapuku <i>Polyprion oxygeneios</i>	Undefined	No detailed stock assessment available. Landings of this species are very small compared to New Zealand and the Commonwealth.	145
Jackass Morwong <i>Nemadactylus macropterus</i>	Fully Fished	The commercial harvest is predominantly by trawlers in the Commonwealth Southern and Eastern Scalefish and Shark Fishery. Commonwealth assessment adopted.	149

SPECIES	STATUS	HARVEST COMMENT	PAGE
John Dory <i>Zeus faber</i>	Fully Fished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment is 'uncertain' but given the small landings in NSW, 'fully fished' is more appropriate in this jurisdiction.	153
Leatherjackets Monacanthidae	Fully Fished	Majority of the leatherjacket catch in NSW is ocean leatherjacket (<i>Nelusetta ayraudi</i>). Stock abundance appears to have increased significantly since 1999/2000	157
Longtail Tuna <i>Thunnus tonggol</i>	Undefined	Recreational fishery is probably more significant than the commercial fishery in NSW.	161
Luderick <i>Girella tricuspidata</i>	Moderately Fished	The current levels of fishing appear to be moderate. Limited markets for luderick constrain commercial catches.	163
Mackerel Tuna <i>Euthynnus affinis</i>	Undefined	Small commercial fishery with low priority for additional assessment. Possibly more significant in the recreational fishery.	167
Mahi Mahi <i>Coryphaena hippurus</i>	Undefined	Mainly targeted by recreational fishers. The species has high growth and high mortality rates. Commonly targeted around FADs (Fish Aggregation Devices).	169
Mako Sharks <i>Isurus</i> spp.	Undefined	Relatively small catches occur in NSW and the species has a global distribution. Mako sharks are an important target species in the recreational gamefish fishery.	171
Mantis Shrimps Stomatopoda	Undefined	Species identification issues need to be resolved. Possibly several families represented in what are extremely small commercial landings.	175
Mirror Dory <i>Zenopsis nebulosus</i>	Uncertain	Predominantly a Commonwealth fishery, the uncertain exploitation status from Commonwealth stock assessment process will be adopted.	177
Mulloway <i>Argyrosomus japonicus</i>	Overfished	Age composition is strongly indicative of an overfished stock and the spawning potential ratio is below the recommended threshold. A recovery plan will be drafted in 2008.	181
Ocean Perch Sebastidae	Uncertain	Three species comprise this group. Significant in both the Ocean Trawl and Ocean Trap and Line Fisheries but most of the catch comes from the Commonwealth South East Trawl fishery.	185
Ocean Trawl Squid Teuthida	Undefined	Trawl landings off southern NSW are dominated by Gould's squid (<i>Nototodarus gouldi</i>) but small proportions of morphologically similar species are likely to be present in catches.	189
Octopus <i>Octopus</i> spp.	Undefined	Lack of biological information on the species harvested precludes resource assessment at this time.	193
Pearl Perch <i>Glaucosoma scapulare</i>	Undefined	The species is predominantly harvested in Queensland. Biological research on this species has recently been completed in NSW.	197

SPECIES	STATUS	HARVEST COMMENT	PAGE
Pigfish <i>Bodianus</i> spp.	Fully Fished	Age and growth information is now available for eastern blackspot pigfish, which suggest that fishing mortality is approximately the same as natural mortality.	201
Pipi <i>Donax deltooides</i>	Undefined	Decline in catches from peak in 2000/01. Catch rates and catches are highly variable.	205
Red Gurnard and Latchets Triglidae	Undefined	Mix of three species and there is little biological data. This will make the group difficult to assess.	209
Redfish <i>Centroberyx affinis</i>	Growth Overfished	Predominantly a Commonwealth fishery. The population is growth overfished and is very much depleted but there is insufficient evidence to indicate recruitment overfishing.	213
River Eels <i>Anguilla</i> spp.	Uncertain	Assessment is variable between catchments. Decline in effort has resulted in a stable catch rate.	217
River Garfish <i>Hyporhamphus regularis ardelio</i>	Fully Fished	Fishing mortality is approximately equal to natural mortality. Status will vary from estuary to estuary but, state-wide, the species should be considered to be fully fished.	221
Royal Red Prawn <i>Haliporoides sibogae</i>	Lightly Fished	The limited targeting of this species and the declining catch is associated with a decrease in the market price for this species.	225
Sand Whiting <i>Sillago ciliata</i>	Fully Fished	Targeted by recreational anglers and commercial fishers throughout their range. Mesh-netting catch rates are stable in estuaries.	229
Sawsharks <i>Pristiophorus</i> spp.	Undefined	Mainly one species harvested off NSW, but little information available. Biological information from local populations should be collected.	233
School Prawn <i>Metapenaeus macleayi</i>	Growth Overfished	Considered to be growth overfished in some areas. Stock in each major estuary should be assessed separately. Two major research projects involving school prawns will be finalised in 2008.	235
Sea Mullet <i>Mugil cephalus</i>	Fully Fished	A long history of stable landings is evident in both the estuary and ocean fisheries.	239
Shovelnose Rays Rajiformes	Undefined	Quality of the assessment is constrained by the uncertain composition of the species caught, however, eastern shovelnose ray is the most commonly caught species in this group.	243
Silver Trevally <i>Pseudocaranx georgianus</i>	Growth Overfished	Fishery and assessment have not changed significantly since the report from FRDC Project 97/125 completed in 2000. Minimum legal length of 30 cm total length implemented in September 2007.	247
Snapper <i>Pagrus auratus</i>	Growth Overfished	Increasing the minimum legal length appears to have improved the state of the snapper stock, however the stock is still assessed as being growth overfished.	251

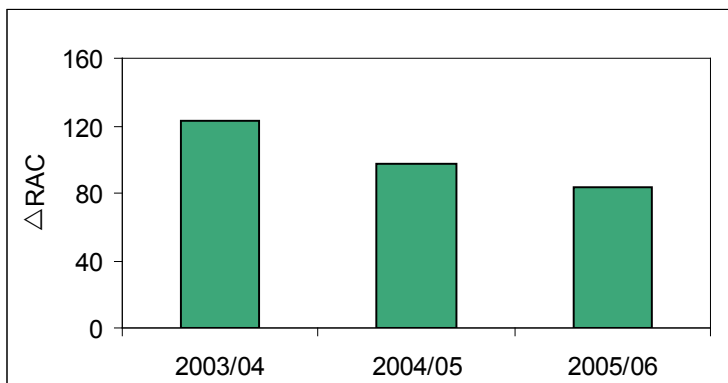
SPECIES	STATUS	HARVEST COMMENT	PAGE
Soles Soleidae and Cynoglossidae	Undefined	Mixture of species not well identified in reported landing data. Monitoring project has collected some size composition information for black and tongue sole, but there is very little biological information available for these species.	255
Southern Calamari <i>Sepioteuthis australis</i>	Undefined	No detailed stock assessment available. The species is short-lived and would likely have a high natural mortality rate.	257
Spanish Mackerel <i>Scomberomorus commerson</i>	Fully Fished	Majority of the commercial harvest occurs in Queensland waters and the results from the Queensland assessment have been adopted. An assessment of this species on the basis of information from NSW is not appropriate.	261
Spanner Crab <i>Ranina ranina</i>	Fully Fished	Joint fishery-independent monitoring between NSW and Queensland occurs for this shared stock. Both the Queensland and NSW populations have been fished down but catch rates are now relatively stable in both fisheries. Results from fishery-independent surveys do not indicate any concerns for the stock.	265
Spotted Mackerel <i>Scomberomorus munroi</i>	Fully Fished	Predominantly harvested in Queensland, where assessment indicates that current recreational and commercial catch approximates the maximum sustainable yield.	269
Stout Whiting <i>Sillago robusta</i>	Fully Fished	This small, fast growing fish has stable land ings of around 300-500 t in NSW. The stock is also shared with Queensland who manage the species with catch quotas.	273
Striped Grunters Terapontidae	Undefined	Striped grunter are small estuary/inshore fish caught as byproduct in estuarine and inshore ocean fisheries.	277
Sweep <i>Scorpiis lineolatus</i>	Fully Fished	No indication of heavy fishing pressure on the stock. Fully fished in localised areas such as Wollongong but maybe moderately fished state-wide.	279
Tarwhine <i>Rhabdosargus sarba</i>	Fully Fished	Age and growth studies have been completed indicating that fishing mortality is similar to natural mortality.	283
Teraglin <i>Atractoscion aequidens</i>	Undefined	Species appears to be highly susceptible to commercial and recreational line fishing methods. Some concerns about possible long term decline in the stock.	287
Tiger Flathead <i>Neoplatycephalus richardsoni</i>	Fully Fished	Predominantly a Commonwealth fishery, exploitation status from Commonwealth stock assessment was adopted.	291
Tiger Shark <i>Galeocerdo cuvier</i>	Undefined	Tiger sharks are an important target species in the recreational club-based gamefish fishery. NSW commercial catches are likely to be smaller than recreational catches off NSW.	295

SPECIES	STATUS	HARVEST COMMENT	PAGE
Tilefish <i>Branchiostegus</i> spp.	Undefined	Both species have a restricted distribution off northern and central NSW. No detailed stock assessment is available and little biological information is available.	297
Trumpeter Whiting <i>Sillago maculata</i>	Undefined	Small commercial fishery, mainly from a few estuaries. Recreational fishery is probably of a similar order of magnitude as the commercial fishery.	301
Whaler Sharks <i>Carcharhinus</i> spp.	Undefined	Complex of species that are very difficult to identify (particularly as juveniles). The line fishery observer project will work towards clarifying the commercial catches of these species.	305
Whitebait - Sandy Sprat <i>Hyperlophus vittatus</i>	Undefined	Sandy sprat (<i>Hyperlophus vittatus</i>) constitutes the majority of the catch. Other sprats (<i>Spratelloides</i> spp.) and anchovies (<i>Engraulis</i> spp.) may also occur in catches.	309
Wobbegong Sharks <i>Orectolobus</i> spp.	Undefined	No detailed stock assessment available. More detailed reporting now required on commercial catch return forms.	313
Yellowfin Bream <i>Acanthopagrus australis</i>	Fully Fished	The yellowfin bream has a long history of stability of both the length composition and catch rate data. The species is the basis of very significant recreational and commercial fisheries in NSW.	317
Yellowfin Tuna <i>Thunnus albacares</i>	Undefined	Important recreational gamefish species in NSW but the dominant commercial fishery is managed by the Commonwealth.	321
Yellowtail Kingfish <i>Seriola lalandi</i>	Growth Overfished	Catch rates by line fishing increased after banning of trapping in 1996 to a peak in 2002/03. Both catch and catch rate now appear to be stabilising.	325
Yellowtail Scad <i>Trachurus novaezelandiae</i>	Fully Fished	Monitoring data indicate that the stock is fully fished (note that monitoring data are mainly representative of the oceanic purse seine fishery in Zone 7).	329

Resource Assessment Performance

Key species have a range of requirements for resource assessment. A target assessment class was originally nominated for each species and the current class is updated at the annual Resource Assessment Workshop. The following figure and table summarise the Resource Assessment Classes for all key species.

Performance Indicator for Resource Assessment



The sum of the difference between the current and target Resource Assessment Class (Δ RAC) of all key species from the Estuary General, Estuary Prawn Trawl, Ocean Hauling, Ocean Trawl and Ocean Trap and Line Fisheries from 2003/04 to 2005/06.

Summary of the current and target Resource Assessment Classes (RAC) for all key species.

SPECIES	RAC 2005/2006	RAC TARGET
Angel Sharks	4	3
Australian Anchovy	4	2
Australian Salmon	4	2
Australian Sardine	3	2
Banded Rockcod	4	3
Bass Groper	4	3
Beachworms	4	3
Bigeyes	4	4
Blue Mackerel	3	2
Blue Swimmer Crab	2	2
Blue-eye Trevalla	3	2
Bluespotted Flathead	4	2
Boarfish	4	3
Bonito	4	2
Brown Tiger Prawn	4	3
Bugs	3	2
Catfish	4	3
Cockles	4	3
Common Jack Mackerel	4	3
Common Silverbiddy	4	3
Cuttlefish	4	3
Dart	4	2
Diamondfish	4	4
Dogfish	4	3
Dusky Flathead	3	2
Eastern King Prawn	2	2
Eastern School Whiting	3	2
Eastern Sea Garfish	2	2
Estuary Squid	3	2
Flounders	4	3
Frigate Mackerel	4	3
Gemfish	1	1
Ghostsharks	4	3
Giant Mud Crab	4	2
Goatfish	4	3
Goldspot Mullet	3	3
Greentail Prawn	4	3
Grey Morwong	3	2
Gummy Shark	4	3
Hairtail	4	3
Hammerhead Sharks	4	3
Hapuku	4	3
Jackass Morwong	4	3
John Dory	4	3
Leatherjackets	3	3
Longtail Tuna	4	4

SPECIES	RAC 2005/2006	RAC TARGET
Luderick	3	2
Mackerel Tuna	4	4
Mahi Mahi	4	3
Mako Sharks	4	3
Mantis Shrimps	4	4
Mirror Dory	4	3
Mulloway	2	2
Ocean Perch	4	3
Ocean Trawl Squid	4	3
Octopus	4	2
Pearl Perch	4	3
Pigfish	3	3
Pipi	4	2
Red Gurnard and Latchets	4	3
Redfish	3	2
River Eels	3	2
River Garfish	3	3
Royal Red Prawn	4	3
Sand Whiting	3	2
Sawsharks	4	3
School Prawn	2	2
Sea Mullet	2	2
Shovelnose Rays	4	2
Silver Trevally	3	2
Snapper	3	2
Soles	4	3
Southern Calamari	4	3
Spanish Mackerel	4	3
Spanner Crab	2	2
Spotted Mackerel	4	3
Stout Whiting	4	2
Striped Grunters	4	3
Sweep	3	2
Tarwhine	3	3
Teraglin	4	2
Tiger Flathead	4	2
Tiger Shark	4	3
Tilefish	4	3
Trumpeter Whiting	3	2
Whaler Sharks	4	3
Whitebait - Sandy Sprat	4	3
Wobbegong Sharks	4	3
Yellowfin Bream	3	2
Yellowfin Tuna	4	3
Yellowtail Kingfish	3	2
Yellowtail Scad	2	2



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