
Fisheries management paper

A Strategy for
the Future Management
of the Joint Authority
Northern Shark Fishery

A discussion paper
prepared by Tim Bray and Jo Kennedy

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WOULD YOU LIKE TO COMMENT?

A Strategy for the Future Management of the Joint Authority Northern Shark Fishery is designed to inform the general public about the issues affecting - and the possible future management of - the Joint Authority Northern Shark Fishery. Fisheries WA would like to know what you think about the management options put forward in this report.

WHY COMMENT?

As it is envisaged that the proposals described in this paper will form the basis for the future management of the Joint Authority Northern Shark Fishery, Fisheries WA would like to obtain comment from the community on these strategies prior to the management package being finalised. Written submissions from either individuals or groups are welcome.

POINTS TO CONSIDER

To ensure that your comments are as effective as possible, please:

- clearly and briefly describe each separate subject that you wish to address;
- assist us by referring to the relevant section/s page numbers in the paper;
- tell us whether you agree or disagree with any or all of the issues identified under each heading, or are simply commenting on those of special interest to you;
- clearly state your views and feel free to quote from other documents/sources of information, where appropriate; and
- feel free to suggest ways of resolving any of the issues you have raised.

RESPONSES TO SUBMISSIONS

The issues raised in all submissions will be summarised according to the topics discussed and distributed to those who provided comment. The results of the submission phase will be considered when finalising the management strategy for the fishery.

WHERE AND WHEN TO SEND YOUR SUBMISSION

The closing date for submissions is, 30 September 1998. Please send your submission, along with your full name, address and association details (if appropriate) to:

The Executive Director
Attention: Shark Program Manager
Fisheries WA
Locked Bag 39
Cloisters Square Post Office
PERTH WA 6850

WHERE TO GET EXTRA COPIES OF THIS DOCUMENT

For extra copies of this paper, please contact:

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Fisheries WA
Locked Bag 39
Cloisters Square Post Office
PERTH WA 6850
Phone: (08) 9482 7333

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EXECUTIVE SUMMARY

This paper discusses the current status of the Joint Authority Northern Shark Fishery (JANSF), and the major issues affecting it. The main aim of the document is to present a series of recommendations to enable effective future management of this resource.

A summary of the recommendations is given in this section of the document.

The paper provides a brief introduction to the JANSF, followed by an examination of the resource base of the fishery (primary species, stock distribution and stock assessment). The issue of by-catch is then discussed, followed by an outline of the proposed management strategy. Elements of this management strategy include: entry criteria for the fishery; prohibition of shark finning; approved fishing methods; gear restrictions; possession limits on important by-catch species; and a requirement for operators in the fishery to complete research logbooks.

It is envisaged that the management package ultimately adopted will be implemented either by the development of an Interim Managed Fishery Management Plan, or by means of regulations included within the *Fish Resources Management Regulations, 1995*.

You have the opportunity to make written submissions relating to this paper prior to the finalisation of the management strategy. During the period in which submissions will be accepted, Fisheries WA will actively consult with key stakeholders.

Summary of Management Proposals

- 1) to ensure that exploitation of shark within this fishery is carried out in a sustainable manner;
- 2) to minimise the by-catch of scalefish and the accidental capture of marine cetaceans;
- 3) to phase out the use of gillnets in the 12 months following the implementation of new management measures; and
- 4) to stop the practice of shark finning.

Proposed Elements of the Management Package

1 Entry Criteria

That to be granted an authorisation to operate in the JANSF, applicants satisfy the following criterion:

- the applicant was the holder of a Commonwealth Permit which endorsed the authorisation holder to fish within the WA zone of the Commonwealth Northern Shark Fishery as at 2 February 1995.

2 Prohibited Fishing Practices

Shark Finning

That the practice of shark finning be banned and that fishers be permitted to carry a maximum of four fins per landed trunk.

3 Approved Fishing Methods and Gear Restrictions

Demersal Shark Longline

- (a) That demersal shark longline be the approved method for the targeting of shark in the fishery.
- (b) That the approved hook specification in the JANSF be no smaller than 12/O Milward long shank.

Gillnet

- (a) That gillnets be phased out in the 12 months following the implementation of new management measures.

4 Possession Limits

- 1) Barramundi - no fish at any time.
- 2) Fish of the species: *Epinephelus tukula* (potato cod), *Epinephelus lanceolatus* (giant or Queensland groper), *Cheilinus undulatus* (Maori wrasse) and *Cromileptes altivelis* (barramundi cod) - no fish at any time.
- (3) Fish of the families: *Lutjanidae* (snapper);

Lethrinidae (emperors); *Serranidae* (cods, groppers and coral trout); *Nemipteridae* (threadfin breams); *Haemulidae* (sweetlips and javelin-fish); and *Labridae* (wrasses) - no more than a total of 10 fish at any time (any combination of the species).

- 4) Billfish (families *Istiophoridae* and *Xiphidae*), southern bluefin tuna and northern bluefin tuna - no fish at any time.
- 5) Yellowfin tuna and bigeye tuna - no more than a total of two fish at any time (any combination of the species).
- 6) Jack, Peruvian jack, yellowtail jack and blue mackerels; albacore, longtail and skipjack tunas; redbait; and fish of the family *Bramidae* - no more than a total of 10 fish at any time (any combination of the species).

5 Research Logbooks

Participants in the JANSF be required to complete research logbooks as developed by Fisheries WA and the holders of authorisations.

6 Other Management Measures

The introduction of additional management measures in the JANSF will also be examined. One measure currently being considered is the implementation of performance criteria to determine on-going access.

1.0 INTRODUCTION

Prior to the implementation of the last Offshore Constitutional Settlement (OCS) on 3 February 1995, the JANSF was part of the Commonwealth-controlled Northern Shark Fishery. This fishery extended across northern Australia, with those fishers operating on the north west coast having been permitted to use pelagic gillnets seaward of 12 nm and pelagic and demersal longlines seaward of 3 nm.

Until 1986, when foreign fishing was banned, there had been a long history of fishing operations by overseas vessels (in particular, boats from Taiwan, using pelagic gillnets) in the region. There had also been increasing interest in the Commonwealth Northern Shark Fishery from Australian operators displaced from other fisheries. The domestic fleet was prevented from expanding further when, in January 1992, the Commonwealth Northern Shark Fishery was proclaimed limited entry.

The JANSF was created following the implementation of the most recent OCS arrangements. It covers waters east of 123°45'E longitude and north of 17°S latitude to the limit of the Australian Fishing Zone (AFZ) and the Northern Territory border (see Figure 1).

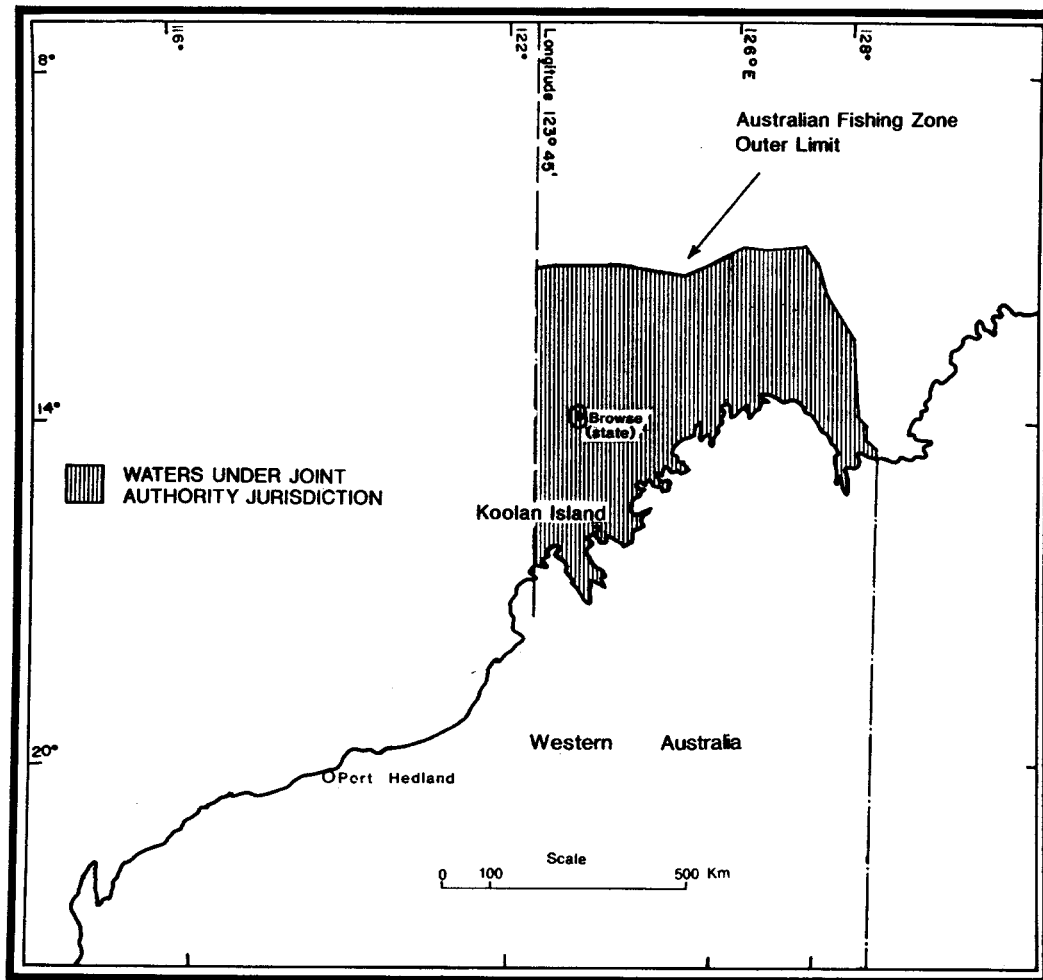


Figure 1 Joint Authority Northern Shark Fishery

The JANSF primarily targets black-tip sharks, but includes the taking of all sharks and rays of the class *Chondrichthyes*, as well as bony fish of the class *Osteichthyes* caught as by-catch, using pelagic gillnet, demersal gillnet and demersal longline. Gillnets may not be used within 3 nm of the low water mark, but there is no such restriction on the use of longlines.

The JANSF is managed under WA law by the State and Commonwealth governments through the WA Fisheries Joint Authority. While no further access has been granted (four operators are permitted to fish within the fishery), since the OCS arrangements came into effect there has been no further development of formal management arrangements. Currently, access to the JANSF is authorised by means of a letter of endorsement only, and there is no limit on the amount of effort that may be used by endorsed operators.

2.0 RESOURCE BASE OF THE FISHERY

2.1 Primary Species and Stock Distribution

Owing to its short history, there is little catch data available for the JANSF. However, it is known that in the financial year 1 July 1995 to 30 June 1996, 38 tonnes of black-tip shark, 12 tonnes of hammerhead shark and 22 tonnes of other shark species were reported as having been taken. A significant quantity of spot-tail shark is also believed to have been included in the catch.

Depending on the availability of funds, research will be undertaken to more accurately assess the composition of the catch in this fishery. In the interim, some further understanding of the catch composition and stock structure of the JANSF can be gained through examination of material pertaining to the former Commonwealth Northern Shark Fishery, as the stock structure is thought to be similar in both fisheries.

The principal shark species targeted in the Commonwealth Northern Shark Fishery were the black-tip (*Carcharhinus tilstoni*) and the spot-tail (*C. sorrah*). Recent evidence suggests that these species exist as single stocks which are comprised of three substocks (top end/Arafura, Gulf of Carpentaria and Bonaparte Gulf).

The exchange rate between these substocks is believed to be quite low (1 - 10% per year). It is likely that the top end/Arafura component of the stock is fished by Taiwanese gillnetters and Indonesian longliners operating north of the AFZ.

In addition to these two principal shark species, there was a significant take of milk sharks (*Rhizoprionodon actus* and *R. taylori*) and hammerheads (*Sphyrna* spp.), as well as whalers (*C. obscurus* and *C. brachyurus*).

Fishing in the JANSF is known to be associated with the capture of significant quantities of scalefish species. Data from the Commonwealth Northern Shark Fishery suggests that of these, grey mackerel (*Scomberomorus semifasciatus*), school mackerel (*S. queenslandicus*), Spanish

mackerel (*S. commerson*), long-tail tuna (*Thunnus tonggol*) and mackerel tuna (*Euthynnus affinis*) are likely to be the most common.

Some of these mackerel species are endemic to Australian inshore and offshore waters, but little is known of their stock structure. However, with respect to Spanish mackerel, recent evidence indicates that at least four distinct stocks exist across northern Australia.

The tuna species found in the waters of the former Commonwealth Northern Shark Fishery are distributed throughout the west Indo-Pacific. In Australia, they are found north of 25°S on the west coast and north of 35°S on the east coast. Tuna are migrating fish, believed to form single stocks within the area of the fishery.

It should be noted that the majority of fishing activity in the former Commonwealth Northern Shark Fishery involved the use of pelagic gillnets. As it is proposed that gillnets be phased out in the JANSF in favour of demersal longline (see section 5.4 of this document), the identified capture of scalefish species of the families *Lutjanidae* and *Lethrinidae* is expected to increase.

In view of this overlap with established fishing operations targeting scalefish in the region (in particular, the Northern Demersal Scalefish Interim Managed Fishery and the charter industry), the introduction of restrictions on hook size and hook shape (see section 5.4(a)) and the imposition of possession limits on such species are proposed (see section 5.5).

2.2 Stock Assessment

There has been no stock assessment carried out specifically relating to the JANSF. However, a combination of data from Taiwanese fishing in the Commonwealth Northern Shark Fishery, a past Commonwealth Department of Primary Industry study and tag return data has been used to provide an estimate of sustainable yield.

Catch and effort data obtained from Taiwanese operators indicated that catch per unit effort decreased significantly between 1977 and 1986, suggesting that the resource may have been over-exploited. Catch per unit effort of local fishers operating in inshore waters was higher than that recorded by the Taiwanese fishers.

In 1982 the CSIRO, the (then) Commonwealth Department of Primary Industry and the Fisheries Departments of WA, NT and QLD, combined to undertake research to assess the status of the two primary shark species taken in the Commonwealth Northern Shark Fishery. Based on the results, an annual sustainable yield of 2400 tonnes for black-tip and spot-tail shark combined was suggested for the entire area of the former Commonwealth fishery.

An attempt was made to undertake a more definitive stock assessment at the Joint Australia-Indonesia Workshop on Arafura Sea Fisheries in 1992, but this proved impossible to carry out due to the incompatibility of data sets.

Although the Commonwealth Government introduced a logbook for the Northern Shark Fishery in 1992, there was no follow-up to ensure they were completed. Consequently, the logbooks proved to be of limited value in assessing stock levels and annual sustainable yield.

The most recent attempt at assessing the status of shark stocks in northern Australia was carried out by Karl Walters and Ric Buckworth in July 1997. This assessment used historical catch and effort data for all of northern Australia and the results of CSIRO tagging studies to develop an age-structured population model for black-tip and spot-tail shark stocks. An estimated sustainable yield of 2000 tonnes for these species was recommended across the area of the former Commonwealth Northern Shark Fishery.

Assessment of the status of shark stocks in northern Australia has been complicated by the fact that Australia allows access by traditional Indonesian fishers to an area of the AFZ which partially overlaps with the JANSF. The fishing activity of these Indonesian operators has contributed to the depletion of shark stocks within the AFZ area in which they are permitted to fish.

Also, a number of Taiwanese fishing vessels are endorsed to operate within Indonesian waters adjacent to the JANSF. It is likely that these operators are targeting similar species to those formerly caught within the AFZ and which are now taken by the domestic fleet.

There is a need to obtain a more accurate understanding of shark stocks within the JANSF in order to monitor fishing effort and ascertain the likely impact on shark populations. However, in the absence of data upon which to base an estimate of annual sustainable yield for the JANSF, 667 tonnes per year is proposed. This estimate is based on the following two considerations:

- 1) the species of commercial importance to the JANSF - black-tip, spot-tail and hammerhead sharks - are unit stocks; and
- 2) the area of the JANSF is approximately one third that of the former Commonwealth Northern Shark Fishery.

Depending on the availability of funding, Fisheries WA will be undertaking research to more accurately determine the catch composition of the JANSF, and to assess the status of stocks through examination of catch per unit effort data in the near future.

3.0 BY-CATCH

The use of pelagic gillnets is associated with the capture of mackerel, tuna, marine mammals and turtles. Although there has been no quantitative assessment of the impact of pelagic gillnetting in the JANSF, it has proven to be detrimental in other fisheries.

It is acknowledged that the use of demersal shark longline, which is proposed as the authorised gear method following the phase out of gillnet (see section 5.4), results in the capture of significant quantities of large sharks and scalefish. As previously mentioned, it is for this reason

that the imposition of possession limits on scalefish species (section 5.5) and restrictions on hook specifications (section 5.4) are to be considered in conjunction with this change.

The minimisation of the scalefish by-catch associated with the use of demersal longlines is particularly important, given that the Northern Demersal Scalefish Interim Managed Fishery operates within the waters of the JANSF. If operators in the JANSF continue to catch scalefish in an unrestricted fashion, conflict between the fisheries is likely to arise.

It should also be noted that the Northern Demersal Scalefish Interim Managed Fishery Management Plan includes a possession limit of two sharks per authorised boat.

A significant charter fleet operates off the Kimberley coast. This sector predominantly targets scalefish, thus further underlining the need to minimise the catch of these species in the JANSF. Management measures to prevent the unrestricted growth of the charter industry in WA are also currently under consideration.

4.0 PROPOSALS FOR THE MANAGEMENT OF THE JANSF

4.1 Policy Objectives

Historical evidence has indicated that effort in fisheries that are not managed continues to expand, to the detriment of fish stocks. In the absence of an accurate estimate of annual sustainable yield, the goal of this proposed management strategy is to limit effort within the JANSF, so as to ensure the continued sustainability of stocks for the benefit of the community.

There are four specific objectives of management with respect to the fishery:

- 1) to ensure that exploitation of shark within this fishery is carried out in a sustainable manner;
- 2) to minimise the by-catch of scalefish and the accidental capture of marine cetaceans;
- 3) to phase out the use of gillnets in the 12 months following the implementation of an Interim Managed Fishery Management Plan; and
- 4) to stop the practice of shark finning.

4.2 Entry Criteria

It is proposed that a JANSF Interim Managed Fishery Permit be granted to applicants upon the satisfaction of the following criterion:

- the applicant was the holder of a Commonwealth Permit which endorsed the authorisation holder to fish within the WA zone of the Commonwealth Northern Shark Fishery as at 2 February 1995.

4.3 Prohibited Fishing Practices

Shark Finning

There is concern that with the expanding market for shark fins, particularly in South East Asia, operators in the JANSF may be encouraged to become involved in shark finning. This practice results in captured sharks having their fins removed before the carcass is dumped, dead or alive, back into the ocean.

Shark finning is cruel and wasteful. Further to this, because of the greater yield of fin per shark, larger species which are especially vulnerable to overfishing due to their slow growth and low natural mortality may be targeted. As a result, it is proposed that shark finning be banned and that vessels licensed in the JANSF carry a maximum of four fins per landed trunk.

4.4 Approved Fishing Methods and Gear Restrictions

The following gear restrictions are proposed as a means of reducing the capture of by-catch species. They will also ensure that the gear used in the JANSF is similar to that used in the WA North Coast Shark Fishery.

(a) Demersal Shark Longline

It is proposed that demersal shark longline be the approved method for the taking of shark in the JANSF.

In an effort to reduce the scalefish by-catch associated with this fishing method, restrictions on hook size and shape are suggested.

Research has shown that the capture of scalefish is enhanced through the use of rounded hooks. However, the capture of sharks is aided by the use of long shank hooks, as these prevent sharks from biting through the line. It is also known that larger hooks are effective for the capture of sharks, whilst limiting the quantity of smaller scalefish taken.

With these factors in mind, it is proposed that the approved hook specification be no smaller than 12/O Milward straight long shank.

(b) Gillnet

The *North Coast Shark Fishing (Professional) Notice 1993, Notice No. 602*, prohibits the use of pelagic and demersal gillnets in WA waters east of 114°06'E longitude, unless endorsed on a licensee's Fishing Boat Licence.

There are no licensees endorsed to use gillnets within the WA North Coast Shark Fishery, which operates in waters adjacent to the JANSF. However, in the JANSF, gillnets (in particular, pelagic gillnets) are recognised as a historical method for the taking of shark. Therefore, the letter of authorisation issued to operators in the JANSF allows for the continued use of this gear until such time as more formal management arrangements are implemented.

In order to eliminate the by-catch associated with gillnets, and to bring this fishery into line with the WA North Coast Shark Fishery, it is proposed that gillnets be phased out in the 12 months following the implementation of new management measures.

This 12 month phase out period would provide the opportunity for gillnet users to acquire the equipment and knowledge necessary for the effective use of demersal shark longline.

4.5 Possession Limits

Fisheries WA anticipates that gear restrictions alone will not reduce by-catch, particularly of scalefish, to an acceptable level. Therefore, as a means of further reducing the capture of scalefish in the JANSF, it is proposed that possession limits for scalefish species be introduced. This would serve as a disincentive for shark fishers to target scalefish and help to allay the concerns of operators involved in scalefish fishing operations in the region.

As there are a wide variety of scalefish species taken, the introduction of a mixed species possession limit is considered to be appropriate.

It should be noted that while a possession limit of two fish per person currently applies to vessels in the Kimberley Prawn Fishery (KPF) and the Northern Prawn Fishery (NPF), these limits relate to recreational subsistence fishing only and would not be considered appropriate for adoption in the JANSF.

Possession limits proposed for introduction in the JANSF are as follows:

- 1) Barramundi - no fish at any time.
- 2) Fish of the species: *Epinephelus tukula* (potato cod); *Epinephelus lanceolatus* (giant or Queensland groper); *Cheilinus undulatus* (Maori wrasse); and *Cromileptes altivelis* (barramundi cod) - no fish at any time.
- 3) Fish of the families: *Lutjanidae* (snapper); *Lethrinidae* (emperors);

Serranidae (cods, gropers and coral trout); *Nemipteridae* (threadfin bream); *Haemulidae* (sweetlips and javelin-fish) and *Labridae* (wrasses) - no more than a total of 10 fish at any time (any combination of the species).

With respect to tuna and tuna-like species, the limits as agreed to in the Memorandum Of Understanding with the Commonwealth Government and specified in regulation 18 of the *Fish Resources Management Regulations 1995* will apply. These limits are:

- 1) Billfish (families *Istiophoridae* and *Xiphliidae*), southern bluefin tuna and northern bluefin tuna - no fish at any time.
- 2) Yellowfin tuna and bigeye tuna - no more than a total of two fish at any time (any combination of the species).
- 3) Jack, Peruvian jack, yellowtail jack and blue mackerel; albacore, longtail and skipjack tunas; redbait; and fish of the family *Bramidae* - no more than a total of 10 fish at any time (any combination of the species).

4.6 Research Logbooks

It is suggested that operators endorsed to fish within the JANSF be required to complete research logbooks as developed by Fisheries WA. The information gathered would assist in assessing catch composition and catch per unit effort in the fishery.

4.7 Other Management Measures

In addition to those described above, Fisheries WA will also be examining the introduction of other management measures. One such measure under consideration is the imposition of performance criteria to determine on-going access.

FURTHER READING

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Fowler, J., McLoughlin, K. and Ramm, D. (eds) 1996. *Northern Fish Trawl Fishery and Northern Shark Fishery 1994*. Fisheries Assessment Report compiled by the Northern fisheries Resource Assessment Group. Australian Fisheries Management Authority: Canberra.

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APPENDIX A - GLOSSARY OF SCIENTIFIC NAMES

<i>Batoidea</i> (Suborder)	rays and skates
<i>Bramidae</i> (Family)	pomfrets
<i>Carcharhinidae</i> (Family)	whaler sharks
<i>Carcharhinus brachyurus</i>	bronze whaler
<i>Carcharhinus obscurus</i>	dusky whaler
<i>Carcharhinus sorrah</i>	spot-tail shark
<i>Carcharhinus tilstoni</i>	black-tip shark
<i>Cheilinus undulatus</i>	Maori wrasse
<i>Chondrichthyes</i> (Class)	cartilaginous fish (sharks and rays)
<i>Cromileptes altivelis</i>	barramundi cod
<i>Epinephelus lanceolatus</i>	giant or Queensland groper
<i>Epinephelus takula</i>	potato cod
<i>Euthynnus affinis</i>	mackerel tuna
<i>Haemulidae</i> (Family)	sweetlips and javelin fish
<i>Istiophoridae</i> (Family)	billfish
<i>Labridae</i> (Family)	wrasses
<i>Lamnidae</i> (Family)	mackerel sharks
<i>Lethrinidae</i> (Family)	emperors
<i>Lutjanidae</i> (Family)	snappers
<i>Nemipteridae</i> (Family)	threadfin breams
<i>Osteichthyes</i> (Class)	bony fishi
<i>Rhizopriondon actus</i>	milk shark
<i>Rhizopriondon taylori</i>	Australian sharpnose shark
<i>Scomberomorus commerson</i>	Spanish mackerel
<i>Scomberomorus semifasciatus</i>	grey mackerel
<i>Scomberomorus queenslandicus</i>	school mackerel
<i>Selachii</i> (Suborder)	sharks
<i>Serranidae</i> (Family)	cods, gropers and coral trout
<i>Sphyrna</i> spp.	hammerhead sharks
<i>Sphyrnidae</i> (Family)	hammerhead sharks
<i>Thunnus tonggol</i>	long-tail tuna
<i>Xiphidae</i> (Family)	billfish