

Northern Shark Fishery



Main features

STATUS

- Probably not overfished by domestic fishers.
- Some signs of local depletion.
- Increasing demersal longline effort raised concern about status of several shark stocks taken by Western Australian northern shark fisheries, leading to management changes.
- Increases in illegal Indonesian fishing targeting shark fin in 2005 and 2006 a cause for concern, although this activity has since declined.

CURRENT CATCH

- 2006 Northern Territory component: total shark catch 780 t (457 t black-tip shark).
- 2006 Queensland component: total shark catch 620 t from Gulf of Carpentaria.
- 2005–06 Western Australian component: shark catch 189 t from northern shark fisheries (state-managed North Coast Shark Fishery and joint authority Northern Shark Fishery combined).

- Grey mackerel also a target species—significant catches in Northern Territory and Queensland net fisheries.

RELIABILITY OF THE ASSESSMENT

- Reporting of shark bycatch in other domestic fisheries has been poor but is improving.
- Catch by Indonesian fishers in Australian and Indonesian waters, and how much some shark stocks are shared, are unknown.

MANAGEMENT METHODS

- Managed cooperatively under Queensland, Northern Territory and Western Australian jurisdiction by three separate Australian Government–state/territory government joint authorities.
- Wildlife Trade Operation (WTO) approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the Western Australian joint authority fishery revoked in April 2008, preventing the export of product from the fishery.

Background

The demersal and pelagic fish resources in northern Australian waters are diverse and substantial. Foreign trawlers and gillnetters fished the region for many years before 1979, when the Australian Fishing Zone (AFZ) was declared. Shark were fished commercially off northern Australia between 1974 and 1986 by a pelagic gillnet fishery operated by vessels from Taiwan, their catches peaking at about 10 000 t in 1977. The ban on gillnets longer than 2.5 km in May 1986 because of concerns about the incidental capture of dolphin effectively closed down foreign fishing, which had been using gillnets up to 20 km long. Foreign trawling ended in 1990, but some foreign longline vessels were licensed to fish for shark in northern waters in 1990 and 1991.

Commonwealth-managed fisheries for demersal and pelagic resources—the Northern Finfish Fishery and the Northern Shark Fishery—were developed in the 1980s and 1990s. In 1995, under the Offshore Constitutional Settlement, jurisdiction over the resources was transferred to joint authorities of the Australian Government and the governments of Western Australia, the Northern Territory and Queensland. The joint authority arrangements are species-based as well as area-based, and are implemented through state or territory legislation. The Western Australia Fisheries Joint Authority is responsible for shark taken in all waters within the AFZ in the north of the state east of 123° 45' E, whereas jurisdiction over finfish resources passed directly to Western Australia. In addition to managing shark fishing, the Northern Territory Fisheries Joint Authority and the Queensland Fisheries Joint Authority manage northern demersal and pelagic finfish (with the exceptions of tuna and tuna-like species) in waters adjacent to each jurisdiction out to the boundary of the AFZ.

Australian gillnetters began fishing around 1980. The main fishing method is pelagic gillnetting, with most activity in waters off

the Northern Territory. The main northern commercial species are two species of black-tip shark (*Carcharhinus tilstoni* and *C. sorrah*). Hammerhead sharks (Sphyrnidae) and mackerels (principally grey mackerel, *Scomberomorus semifasciatus*) are also caught. Sharks are mainly fished in Northern Territory waters in inshore areas around the perimeter of the Gulf of Carpentaria and west to the Goulburn Islands, Van Diemen Gulf, Fog Bay and Joseph Bonaparte Gulf. Many shark species are also taken as bycatch in other Commonwealth-managed and state- or territory-managed fisheries.

Northern Territory

Fishing effort targeting shark and mackerel in the Northern Territory Fisheries Joint Authority shark fishery remained low for a number of years, increased between 1994 (550 boat-days) and 1997 (1400 days) and, after decreasing in 1999 (570 days), increased again to a peak in 2003 (1800 days). Fishing effort has since dropped as a result of effort controls triggered when the catch of byproduct shark species exceeded certain reference points. A byproduct management plan is being implemented. There were 1176 boat-days of fishing effort in 2005 and 899 days in 2006. Other measures introduced in response to a strategic assessment under the EPBC Act also resulted in effort reduction.

Although pelagic gillnets are the main fishing gear, longlines can be used. One operator began longlining for sharks in 2002, and the number of days fished by longline trebled from 2002 to 2003.

Reported landings of the targeted shark fishery in 2002 in Northern Territory waters were 1167 t. In 2003, the highest catch to date—1687 t—was reported (899 t shark, of which 501 t was black-tip, and 766 t grey mackerel). In response to a tightening of management arrangements, landings decreased to 1559 t in 2004, 1398 t in 2005 and 1293 t in 2006 (780 t shark, of which 457 t was black-tip, and 404 t grey mackerel), valued at \$4.3 million.

Queensland

After jurisdiction over shark passed to the Queensland Fisheries Joint Authority, the Queensland Government established several fisheries in Gulf of Carpentaria waters off Queensland. A gillnet fishery targeting tropical sharks and grey mackerel was established in a band 7–25 nm from the coastline. There are five licences in the fishery, each entitled to use 1200 m of net. As in Northern Territory waters, barramundi fishers operating in Gulf waters out to 7 nm also take sharks. A total shark catch of 205 t was reported in 2006 for these two fisheries (435 t in 2005). An increasing amount of shark is also being taken by multiple-hook line fisheries operating in the Gulf outside the 25 nm line. An Offshore Constitutional Settlement arrangement between the Australian Government and Queensland, gazetted in July 2003, specifies that grey mackerel in the Gulf be managed by the Queensland Fisheries Joint Authority under Queensland law.

Western Australia

The small number of operators prevents the publication of catch-and-effort figures for the Western Australia Joint Authority Northern Shark Fishery that operates from longitude 123° 45' E to the Northern Territory border. Approved fishing gears are gillnets and longlines. For assessment purposes, the joint authority fishery is combined with the adjacent state shark fishery managed by the Western Australian Government (the Western Australia North Coast Shark Fishery) because some species are common to both fisheries. The state-managed fishery operates from longitude 114° 06' E to 123° 45' E, with droplines and longlines allowed but not gillnets. There are nine licences in the state fishery and five in the joint authority fishery.

The total reported shark landings for the two fisheries rose markedly in 2001 and subsequent years, leading to concern that latent effort could be further activated. The catch of 456 t for the 2001–02 financial year was (at that time) the highest on record, and

68% higher than the catch in 2000–01.

Fishing effort increased by 91% in 2001–02, with a greater focus on gillnet fishing in the north-east region of the fishery and a resultant increase in catches of black-tip shark. Catches increased further in 2002–03 (490 t), 2003–04 (591 t) and 2004–05 (1294 t), with longline becoming the dominant fishing method. The 2004–05 catch was valued at \$2.9 million, mainly as a consequence of the high value of fins. Reported longline effort in 2004–05 was the highest on record (1.2 million hook-days compared with 717 000 in 2003–04). The main species taken in 2004–05 were sandbar shark (*Carcharhinus plumbeus* 762 t, compared with a reported 209 t in 2003–04), hammerhead sharks (Sphyrnidae 114 t), pigeye shark (*C. amboinensis* 83 t) and tiger shark (*Galeocerdo cuvier* 81 t). An additional 254 t of other sharks and rays and 8 t of scalefish were reported.

The shift away from gillnets in the joint authority fishery changed the species composition of the catch from black-tip sharks to large, demersal species (hammerhead, pigeye and tiger sharks). For the combined state and joint authority fisheries, only 78 t of black-tip shark were reported in 2004–05, compared with around 180 t in 2001–02 and 2002–03. Significant quantities of sandbar shark are also taken by other Western Australian fisheries, to such an extent that current total catches are considered unsustainable. There is also concern over the status of other shark species taken in the fishery. The Western Australian Government reviewed management arrangements for its shark fisheries and in 2006 introduced changes to reduce impacts on several species, particularly sandbar shark and dusky shark (*C. obscurus*). Those management changes and uncertainty over the future of the fishery have resulted in little fishing activity since 2004–05. Reported catch for the combined state and joint authority fisheries for 2005–06 was 189 t, with black-tip shark the major component at 76 t. Longlines took 84% of the catch with about 142 000 hook days reported for the year.

Illegal fishing

Markets have developed for a range of shark products other than flesh, including fin, cartilage, liver and skin. Dried shark fin can fetch over \$300/kg on Asian markets. Sharks are often taken incidentally in northern Australia by a range of gear, but especially in the Northern Prawn Fishery, for which the annual catch of black-tip shark was reported to be at least 100 t in 1991. However, a ban on the retention of shark product in that fishery was introduced at the start of 2001, and bycatch reduction devices have been introduced to reduce shark bycatch.

Australia allows access by traditional Indonesian fishers to a limited area of the AFZ off north-western Western Australia. The size and composition of the catches taken by those vessels and Indonesian vessels operating illegally in Australian waters are unknown. Heavy fishing pressure in Indonesian waters has made fishing in the AFZ increasingly attractive. Illegal fishing activity in northern Australian waters appears to have increased until very recently, as has the sophistication of vessels being apprehended. The Australian Government has responded with a major increase in the level of surveillance and policing.

A total of 216 Indonesian vessels were apprehended in northern Australian waters in 2006–07 (compared with 367 in 2005–06 and 2003 in 2004–05) and a further 5 legislative forfeitures in which vessels had catch and gear confiscated (compared with 281 forfeitures in 2005–06 and 178 in 2004–05). Further declines in subsequent months signalled a major decrease in the level of illegal activity. Shark fin is a major target for many of the apprehended vessels because of its high value and ease of storage. Research is in progress to examine the effort by illegal fishers and the species composition of confiscated catches.

Status of stocks

Although catches of shark species are below estimates of sustainable yield, the estimates are not particularly robust. Industry was sceptical about the estimated rate at which shark numbers rebuild in fished areas, and requested a more detailed review of the yield estimates. A workshop held in response to that request in 1997 found the sustainable yield for black-tip shark to be at least 2000 t per year for the Northern Territory, Queensland and Western Australian fisheries combined. An increased focus on shark stocks has led to the formation of an assessment group to examine the status of northern shark stocks. At the group's first meeting in April 2005, its preliminary assessment found no substantial change to the estimated sustainable yield.

The potential to realise the estimated yield may be limited by the extent of catches taken by illegal fishing in Australian waters and fishing on possibly shared stocks in Indonesian waters. The overall catch rates of domestic fishers declined from the mid-1980s. This may be attributable to foreign fishing, but it is also possible that the declines resulted from the slow depletion of an inshore, resident component of the overall stock. Catch rates for black-tip shark in Northern Territory waters have been relatively steady since the mid-1990s, while those for grey mackerel have steadily increased. Overall catch rates for shark increased markedly in 2004 and 2005 because of increased targeting of large shark and the introduction of fin ratios into the management arrangements (encouraging the retention of all usable product). The level of fishing effort targeting sharks in Indonesian waters, coupled with the recent increases in effort across northern Australia, suggests that there should be close monitoring of all northern shark fishing. The assessment will be updated in 2008.

Recent genetic studies have highlighted an issue that may have important consequences for the fishery. Studies in the 1980s revealed the black-tip shark *C. tilstoni* to be the major component of shark catches, with another black-tip shark, *C. limbatus*, found in much

lower numbers (an overall *C. tilstoni* to *C. limbatus* ratio of approximately 300:1). More recent studies have indicated a ratio of close to 1:1 of these two species in samples examined. Available biological information for *C. limbatus* suggests it is a less productive species than *C. tilstoni*. Whether or not a change of this magnitude has really occurred, the current impact of fishing on both species will need to be considered in future management.

Recent research efforts have focused on improving species identification and catch recording in fishery logbooks through the development of species-identification guides and observer programs. A collaborative research project including the states, the Northern Territory and the Australian Government has conducted a risk assessment of shark species across northern Australia to improve understanding of the impacts of fishing across all sectors that catch shark. In addition, a project funded by the Australian Centre for International Agricultural Research has provided information on the degree to which key species are shared by Australia and Indonesia.

The Queensland and Northern Territory shark fisheries have been WTO approved under the EPBC Act (until August 2009 for the Queensland fishery and November 2010 for the Northern Territory fishery). The Western Australian fishery was also WTO approved, subject to several conditions being met, but the approval was revoked in 2008.

In 2004, the Australian Government released its National Plan of Action for Sharks. Fisheries agencies engaged with management of the northern shark resources have developed an operational plan to address the priorities identified by the national plan. It will be reviewed in 2008.

Further reading

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