

*NSW Fisheries*

*Discussion paper for*  
***Grey Nurse Shark***  
***Protection***



July 2003



## Introduction

New protection measures for grey nurse sharks came into force on 1 December 2002. A review of these protection measures is required because we now believe grey nurse shark numbers are lower than thought, and because the rate at which these sharks are being caught accidentally is too high - 5 of the 24 sharks recently tagged as part of a scientific monitoring program have been seen by divers with fishing hooks attached. One shark has been seen with a spear embedded in its shoulder. The results from new radio tagging work that monitors how far these sharks move from their critical habitat shows they forage far beyond the areas designated as critical habitat for their protection.

The Government is conducting an extensive research program - preliminary results now indicate that the grey nurse shark population in NSW is between 300 and 500. There are serious concerns that without proper protection the species may become extinct at some time within the next 40 years.

The grey nurse shark *Carcharias taurus* is listed as an endangered species under the NSW *Fisheries Management Act 1994*. The east coast population of grey nurse shark is listed as critically endangered under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

Despite their fierce appearance, grey nurse sharks are not considered to be dangerous to humans. They are a passive species with teeth designed for capturing prey such as fish, squid and crustaceans.

The grey nurse shark was originally broadly distributed around the world's main continents, primarily in sub-

tropical to cool temperate coastal waters. They have been recorded from the Mediterranean Sea and the Atlantic, Indian and Pacific oceans but they are now restricted to waters off the east coast of the USA, Uruguay, Argentina, South Africa and Australia.

Grey nurse shark populations have declined worldwide. In Japanese waters the population has declined to a point where they are no longer caught. In Brazil, Uruguay and Argentina, fishers catch grey nurse sharks when they fish close to shore. However, catches are declining. In the United States the species is protected from fishing and in South Africa their capture is being phased out.

In Australia, the grey nurse shark is now restricted to two populations, one on the east coast from southern Queensland to southern NSW and the other around the south west coast of Western Australia. The grey nurse shark is now considered to be extinct in Victorian waters. Although we have some information on the status and size of the east coast population, very little is known about the population in Western Australian waters. It is believed that the east and west coast populations do not interact and ongoing research will probably confirm that the populations are genetically different.

The grey nurse shark population in eastern Australia is under serious threat. In NSW it became the first protected shark in the world when the NSW Government protected it from fishing in 1984. Its abundance in NSW and QLD waters declined dramatically prior to 1984 because it was killed in large numbers by hook and line, and spear fishing. Since then numbers have not recovered despite being protected and they have continued to die mainly as a result of accidental catch by hook and line fishers, in bather protection nets, and due to illegal fishing and spear fishing.



## Conservation history

Grey nurse sharks were first listed as a protected fish in NSW (under the then *Fisheries and Oyster Farms Act*) in November 1984. This was in response to concerns over declining populations, and was the first time a shark species had been listed as protected anywhere in the world.

In October 1999 the NSW Government added grey nurse sharks to the list of vulnerable species under the threatened species schedules of the *Fisheries Management Act 1994*. Around this time a series of quarterly underwater surveys began collecting data on the abundances of grey nurse sharks at approximately 60 sites along the NSW coast. A maximum of 292 sharks were observed (in total) during any survey event. Consequently in April 2000, the NSW Government upgraded the status of grey nurse sharks to endangered.

## Current protection

In December 2002, ten grey nurse shark critical habitat areas were declared in NSW waters with associated regulations to control fishing and diving activities. The critical habitat sites are:

- ~ Julian Rocks (Byron Bay)
- ~ Fish Rock (South West Rocks)
- ~ Green Island (South West Rocks)
- ~ The Pinnacle (Forster)
- ~ Big and Little Seal Rocks (South of Forster)
- ~ Little Broughton Island (North of Port Stephens)
- ~ Magic Point (Maroubra - Sydney)
- ~ Bass Point (Shellharbour)
- ~ Tollgate Islands (Batemans Bay)
- ~ Montague Island (Narooma)

At these sites restrictions were introduced last December to limit the impacts of fishing and diving on grey nurse sharks. These include a ban on fishing with bait from anchored or moored vessels within 200 metres, and a ban on commercial drop, drift and set line fishing within 1000 metres of the site. Restrictions on scuba diving include no night diving in critical habitat sites as well as a ban on touching or harassing sharks and on the use of underwater scooters and electronic shark repelling devices.

Damage to critical habitat can lead to a fine of up to \$220,000. Breaking fishing and diving rules in critical habitat sites has a maximum penalty of \$11,000, with a penalty notice of \$500 available for less serious breaches. If a grey nurse shark is caught accidentally it must be returned to the water unharmed - if this occurs then no offence is committed - but if harmed, fines of up to \$220,000 apply.

Other important grey nurse shark sites receive protection as part of the Solitary Islands Marine Park.

## Current situation

There is evidence that an increasing number of grey nurse sharks are being hooked. The incidence of grey nurse sharks with hooks embedded in their jaws has significantly increased from 2% to 12% over the past decade.

Since the introduction of the grey nurse shark critical habitat areas in 2002, grey nurse sharks are still being observed with hooks and line in their mouths within these locations. The continued incidental hooking of grey nurse sharks within these sites is of great concern. In March 2003 a grey nurse shark was found dead within the Magic Point critical habitat area; however this shark had been tagged the previous day by NSW Fisheries scientists when it was released alive. An autopsy found a large shark hook in its throat, another smaller hook in its jaw, and that it had septicaemia (blood poisoning). Results from the NSW Fisheries tagging program show that 5 out of the 24 (17%) of the tagged grey



nurse sharks now have visible hooks that were not present when they were tagged. All but one of these sharks were hooked since December 2002, when the critical habitat regulations were put in place.

Autopsies have also been carried out on 10 grey nurse sharks that have been accidentally caught or killed. Six of these sharks had hooks inside of them. As these hooks were not visible upon the initial, external examination, this suggests that the number of grey nurse sharks with embedded hooks seen during the underwater surveys is probably a significant underestimate of the total number of grey nurse sharks potentially being injured by fish hooks.

Some commercial and recreational fishers have stated that they believe there may be large un-surveyed populations of grey nurse sharks in deeper waters. This theory is not supported by information from the latest tagging results. The tagging work indicates that grey nurse sharks migrate

between the known aggregation sites and that these are all relatively close to shore. They may inhabit deep water at times but they are predominantly found inshore at critical habitat locations where they aggregate to breed and feed.

Historical reports indicate that grey nurse sharks were once found in large numbers all year at deep-water locations such as The Peak off Maroubra in Sydney. Recently, The Peak has been examined by scuba divers on several occasions and there has not been a single sighting of a grey nurse shark. A grey nurse recently caught in deep waters (70 metres) was an individual that had been tagged at a critical habitat location close to shore. This strongly suggests that although some grey nurse sharks may venture into deeper waters, these sharks are part of the same population that is found at the inshore critical habitat sites.

Preliminary results from a CSIRO and NSW Fisheries electronic tracking project has found that grey nurse sharks regularly move 1000 metres from aggregation sites to forage and feed.

### *Population modelling*

The grey nurse shark population is extremely susceptible to mortality from fishing. In modelling experiments, all the scenarios where fishing-related mortality was present, the total grey nurse shark population declined. It will therefore be extremely important to reduce any fishing-related mortality.

### *Potential flow-on benefits of increased protection*

Actions to protect grey nurse sharks may result in a range of flow-on benefits. By increasing protection within key aggregation sites, populations of fish that share these areas such as the threatened black cod may also improve. There is also mounting evidence that protected areas can act as a useful fisheries management tool. There are a range of situations where overall catches may improve once some areas have been protected from fishing. Heavily targeted populations of species such as mulloway and yellowtail kingfish will arguably improve as a result of greater protection at grey nurse shark critical habitat sites.

### *Options for increased protection*

There are many options available to provide increased protection for the grey nurse shark. Whilst it is arguably too soon for the benefits of the new measures implemented in December 2002 to be seen, there may be other things that we can sensibly do to build on, or simplify the current restrictions.

Managing impacts on grey nurse sharks is not easy - they often travel long distances to feed and to reach other aggregation sites. When travelling, they are almost impossible to protect and we have to think beyond the idea of just simply locking up areas if we are going to achieve our goal of increasing our grey nurse shark numbers.

We are interested in your specific views on changes that could be sensibly introduced to increase the current level of protection. The following headings should be used to guide your submission - they do not represent proposals, but have been listed on the basis of suggestions already received by NSW Fisheries. This ensures everyone who might be impacted has the opportunity to comment. This is not an exhaustive list of options - if you have any ideas that could provide additional protection please let us know.

#### **Critical habitat and buffer zone provisions**

In your view are there improvements that could be made to the current critical habitat and buffer zone provisions?

#### **Feeding grounds**

Are there any practical ways of providing increased protection for grey nurse sharks when they are foraging or travelling away from their critical habitat areas?

#### **Hook and bait fishing**

Are there any practical ways that the numbers of grey nurse sharks being hooked, or the impact of hooking can be reduced?

#### **Trolling and drifting**

Trolling and drifting is allowed in the critical habitat areas. Should fishing whilst trolling or drifting be restricted and if so why?

#### **Spear fishing**

It is already illegal to spear grey nurse sharks. Should the areas where spear fishing is allowed be further restricted and if so why?

#### **Commercial net fishing**

Commercial trawl and purse seine fishing is allowed in the buffer zone areas. Is there any reason why commercial fishing of this kind should be further restricted and if so why?

#### **Scuba diving**

Are there any practical ways of managing the potential impact of scuba diving?

#### **Night fishing**

Grey nurse sharks are known to be more active, and to move and feed at dusk and during the night. Would fishing restrictions in critical habitat, buffer zones or other areas during these times be practical and how might they work?

### *Want to comment?*

**Commercial fishers, recreational fishers, scuba divers and the broader community are invited to have their say.**

**Written submissions should be made and posted to:**

- ~ Threatened Species Unit (Grey Nurse Shark), NSW Fisheries, Private Bag 1; Nelson Bay NSW 2315; or
- ~ faxed to NSW Fisheries on (02) 4916 3880; or
- ~ made by using the online submission form available at [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au).

**Comments must be received by Friday 29 August 2003.**