

SHARK BAY

Seaweek 2005
March 6 to 13



SCS
SAVE OUR SHARKS

Recreational fisheries for sharks

By Julian Pepperell



Fishing for river whalers also known as bull sharks (*Carcharhinus leucas*) (© Neil Schultz)

RECREATIONAL FISHERIES FOR SHARKS

By Julian Pepperell

*Pepperell Research and Consulting Pty Ltd, PO Box 1475,
Noosaville, D.C. Queensland 4566, Australia*

Background

In Australia, recreational fishers have caught sharks since the earliest days of European settlement. The crews of the early European exploratory and transport vessels which first touched Australian shores were often keen fishers who fished both for food and enjoyment, while scientists on board often recorded their catches. English privateer William Dampier described a large shark, almost certainly a tiger shark, which his crew caught off the Western Australian coast in 1699. In 1770, Captain James Cook originally named Botany Bay ‘Sting Ray Bay’ because of the abundance of large stingrays there, some of which were caught by his crew. And when Captain Arthur Phillip commanded the first fleet, sent to establish the first penal colony, two of the first four Australian fish ever depicted by his artists were sharks—the wobbegong, and appropriately, the Port Jackson shark, both no doubt caught on a baited hook. Since then, to this day, sharks have been an integral component of the recreational fishing catch right around the Australian coast.

While offshore ‘game fishing’—the capture of large sharks on relatively low breaking-strain line—is probably the most visible and widely publicised form of shark fishing, recreational fishers also catch sharks and rays in many other coastal situations (figures 1 and 2). In some cases, sharks (and occasionally, rays) may be the targets of recreational fishing, but in many other cases, the hooking and capture of sharks and rays is incidental to normal fishing activity.

What's the catch?

Until quite recently, very little information was available on the actual numbers of sharks and rays caught by Australian recreational fishers, especially the smaller species which make up the bulk of the catch. Some statewide surveys had suggested that, while the catch of sharks and rays was not as high as that of more popular species of fish, it was nevertheless significant.

In 2001, an ambitious national survey on recreational and indigenous fishing was undertaken to try to determine the total recreational catch of fish throughout Australia. The survey was able to produce the first reliable estimates of catches of the more common species of fish, but unfortunately, because they were not a major component of the total catch, sharks and rays caught by anglers were not separated to the level of species.



Figure 1. Game fishing (© Julian Pepperell).



Figure 2. Fishing for river whalers also known as bull sharks (*Carcharhinus leucas*) (© Neil Schultz).

Nevertheless, the survey estimated that 228 000 sharks and rays were caught (and retained) recreationally, most (95 percent) by line, but also some by nets and spearfishing (2.2 percent of the total). The main shark fishing State was Victoria, with about 89 000 sharks and rays caught, with the next largest catch recorded in Queensland (36 000). As well, one particularly interesting and important finding of the survey was that a very high percentage (81.8 percent) of sharks and rays caught by anglers were released back into the water—considerably higher than for any other species or group of species. This means that, as well as the 228 000 sharks and rays caught and kept, a further 1.02 million were caught and released by recreational fishers over a 12-month period.

There is a real need though to determine a species breakdown of the recreational catch of sharks and rays, including the released component. And because the released component is so high, there is also a need to assess the post-release survival of at least the more important species of sharks and rays which are being caught by the recreational sector.

There are some directed recreational fisheries for sharks around Australia. School and gummy sharks are fished for in Victoria and Tasmania, while elephant fish (a species of Chondrichthian classified with the sharks) are targeted by a small, specialised recreational fishery in Westernport Bay, Victoria. And as mentioned, there is also a form of game fishing which targets the larger, offshore species of shark.

The development in the late 19th century of rods and reels capable of landing large fish led to inevitable legendary battles and captures of huge sharks in seemingly dangerous and heroic circumstances. Since records have been kept, the largest fish caught on rod and reel have always been sharks, with the existing world record for any species of fish being a white shark of 1 208 kg (2 664 lb) caught off South Australia in 1959.

Over the past several decades however, the trend has been well and truly away from the catch-and-photograph culture and towards an ethic of tag-and-release. Self-imposed size limits for sharks by game fishing organisations have been introduced; greatly encouraging tag-and-release, and today, over 80 percent of sharks caught by game fishers in Australia are tagged and released.

Tag and release

Shark tagging by recreational anglers was pioneered by John Casey of the United States National Marine Fisheries Service. In 1963, Casey set up a pilot program to test the value of anglers tagging sharks on a voluntary basis. That program has been a resounding success, and it has been used by others as a model around the world. (It is significant that all of the recreational tagging programs have arisen in response to demand from the anglers themselves).



Figure 3. Shark tagging gear (© Julian Pepperell).

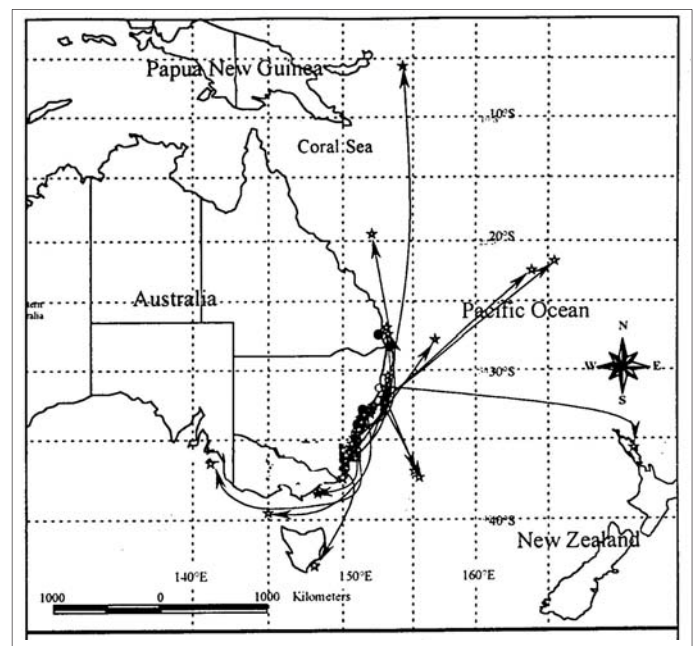


Figure 4. Map of mako shark movements, as determined from recaptures of recreationally tagged makos from the New South Wales Fisheries game fish tagging program (© Ricky Chan).

In Australia, the national gamefish-tagging program was instigated and is still operated by New South Wales Fisheries. Tagging of sharks under that program began in 1973, and since then, over 20 000 sharks have been tagged and released by recreational anglers (figure 3). Of those, about 400 have been recaptured and reported, adding considerably to our knowledge of these difficult-to-study fishes.

The main species of shark tagged by recreational fishers in Australia are shortfin mako (*Isurus oxyrinchus*), followed by



Figure 5. Spot tailed whaler (*Carcharhinus sorrah*) (© Neil Schultz).



Figure 7. River whaler also known as bull shark (*Carcharhinus leucas*) (© Neil Schultz).



Figure 8. Tagged river whaler also known as bull shark (*Carcharhinus leucas*) (© Neil Schultz).



Figure 6. River whaler also known as bull shark (*Carcharhinus leucas*) (© Neil Schultz).



Figure 9. Release of tagged river whaler also known as bull shark (*Carcharhinus leucas*) (© Neil Schultz).

hammerhead species combined (*Sphyrna* spp.), blue sharks (*Prionace glauca*) and whaler sharks combined (*Carcharhinus* spp.). Hammerhead and whaler shark numbers are combined simply because of uncertainties in identification of these species when released.

The results of this voluntary tagging effort have been extremely valuable in determining the movements and growth rates of pelagic sharks. For example, blue sharks tagged off southern New South Wales and Victoria have been recaptured off northern Queensland, and as far away as Java and Vanuatu. As well, mako sharks tagged off Sydney have been recaptured off Papua New Guinea and Fiji (figure 4).

Tagging can also tell us something about longevity of sharks. So far, the record time at liberty for the tagging program is held by a mako shark which was recaptured more than 12 years after tagging. Interestingly, this shark was recaptured quite close to its original release point off Port Hacking south of Sydney (Examples of fishers tagging and releasing sharks are depicted in figures 5 to 9).

Recording the catch

Lists of records for heaviest sharks and rays are maintained by several national recreational fishing organizations. These lists can be useful in determining the maximum sizes to which some species of sharks and rays grow. As well, in many instances, game fishing clubs have maintained remarkably good records of members' catches over many years, thereby providing unique data on various aspects of shark distribution and abundance through time. Analysis of the records of major game-fishing clubs off southeastern Australia over three decades (1961 to 1990) showed that self-collected recreational data could be used to examine such aspects as variation in species composition with latitude and changes in size distribution through time. Results of the study also indicated that care must be taken in analysing such historic data to take into account changes in fishing practices, which can markedly affect both species and size composition of the recorded catch.

As recreational fisheries are being monitored more closely, it is becoming increasingly important to include accurate fishing effort data as well as simply catch. This is because the measure of catch for given units of fishing-effort is used by fisheries scientists as a de facto measure of relative abundance of fish. In the case of sharks, this is currently being monitored by New South Wales Fisheries for game fishing events off southeastern Australia. However, changes in abundance of other species of sharks and rays, as indicated by recreational catches, are not otherwise being monitored.

The impact of recreational fishing on shark populations is difficult to gauge, but as a general comment, is likely to be relatively minor in most cases. For example, in one major New South Wales study of trailer boat catches, the two main shark species caught by anglers were school shark and gummy shark. However, the recreational catches of these species represented only 2.8 percent and 5 percent of their total catches (commercial plus recreational) respectively. Another example is shown by the historic game-fishing catch data for white sharks collated from long-term catch statistics. During the 20 year period before protection of white sharks, the average number of white sharks landed by gamefish anglers in South Australia was 0.9 per year, and 1.7 per year off New South Wales. On the other hand, it is generally accepted that bycatch of white sharks by commercial fisheries in the same areas accounted for at least an order of magnitude greater mortality of this species. Of course, in circumstances where commercial catch, whether targeted or not, is very low, the recreational catch of a given species may be the most significant component of fishing mortality, but there are no known examples of proven overfishing of an elasmobranch species solely or principally by recreational fishing.

The benefits of recreational fishing for sharks may well outweigh some of the perceived negative aspects. In a great many cases, information on shark biology has only become available through recreational data sources. For example, much of what we now know about the extensive movements of blue and mako sharks has been derived from recreational tagging programs both here and overseas. Genetic studies of stock structure of sharks have relied on obtaining samples from gamefishing tournaments, and cooperation with anglers in all aspects of studying shark biology is characteristic of the prevailing culture within organised recreational shark fisheries.

While our knowledge of the offshore recreational fishery for large sharks is reasonably good, information on other recreational fisheries which catch sharks and rays, either intentionally or incidentally, is sadly lacking. With the growing awareness of the susceptibility of some species of sharks to overfishing, it is very important that this gap in our knowledge of human interaction with sharks and rays is quickly filled.

SHARK BAY

 **Seaweed 2005**
March 6 to 13



For further information

National Strategy for the Survival of Released Line
Caught Fish:
www.info-fish.net/releasefish

Acknowledgements

The following organisations/individuals are acknowledged for their contributions: **Funding:** Natural Heritage Trust and the Fisheries Resources Research Fund (Australian Government Department of Agriculture, Fisheries and Forestry). **Coordination of project:** Marine Industries Environment Branch and the Bureau of Rural Sciences (Australian Government Department of Agriculture, Fisheries and Forestry). **Artwork:** Brett Cullen and Trish Hart. **Reviewers:** Bill Sawynok, Carolyn Stewardson and Albert Caton.

© Julian Pepperell (pepj@austarnet.com.au).

This information sheet may be copied for educational purposes.
For any other purpose please contact the author.