SPORT DIVING

ISSUE 141

AUST $7.95 Incl GST

GREY NURSE SHARKS

LOGGERHEADS: THE LOST YEARS

DIGITAL PHOTOGRAPHY: ADDING A LITTLE BIT EXTRA

YOUR CRITTERS IDENTIFIED

UNDERWATER NATURALIST

DISCOVER:

SAFARI MALDIVIAN

LA PEROUSE FINALE

THE ROCK OF POLYNESIA

RAJA REVELATIONS

PALAU DIRECT

TASMANIA

DIVE MEDIC: CARBON DIOXIDE – A SILENT KILLER, PART TWO

CELEBRATING 40 YEARS

ISSN1322-4883

PRINT POST APPROVED PP 241472/00001
PPS 1484/04/2010(028184)

SINGAPORE $7.95 Incl. GST
PAPUA NEW GUINEA K6.00
THAILAND Bht 220
SOLOMON IS. $13.95
HONG KONG $40.00
FIJI $6.00
MALAYSIA RM16.50
INDONESIA Rp 10,000
NZ $8.50 Incl. GST

: DON SILCOCK www.indopacificimages.com

GREY NURSE SHARKS

THE FIGHT FOR AUSTRALIA'S

Main: A large & fully mature Grey Nurse cruises past at the entrance to the cave at Magic Point. Right: Articles from Australian Skindivers Magazine April 1965.

> "LARGE ENOUGH TO GET YOUR COMPLETE AND UNDIVIDED ATTENTION" IS HOW AMERICAN UNDERWATER PHOTOGRAPHER MARTY SNYDERMAN ONCE SUMMED UP AN ENCOUNTER WITH *CARCHARIAS TAURUS*. BIG AND FIERCE-LOOKING WITH PROMINENT SHARP TEETH, THE GREY NURSE MOVES IN A SLOW BUT DETERMINED MANNER THAT CREATES A PHYSICALLY INTIMIDATING PRESENCE GUARANTEED TO RAISE THE BLOOD PRESSURE OF AN UNINITIATED OBSERVER.

My first such encounter was about 15 years ago at Flat Rock near Stradbroke Island in Moreton Bay, Queensland. I was diving the gutters on the northeast where grey nurse sharks are known to gather from June to October each year. Though well briefed on what to expect and do, I was nervous when the first shark headed in my direction. We'd been told not to obstruct a shark's path in any way and stay calm while they swam past – sure enough the almost three-metre female did exactly that...

completely ignoring me! Since then I've spent a fair amount of time underwater with these sharks and been so close I could tell if they had halitosis – but I've never felt threatened or in any danger. So why, in just 40 years, the grey nurse has gone from one of the most common sharks in Australia, to an endangered species when it is not a dangerous shark?

A BAD CASE OF MISTAKEN IDENTITY...

The early 1960s brought increasing prosperity in Australia and urban populations turned increasingly to the sea for sport and entertainment. Surfing, spearfishing and game fishing were popular and the macho image of these water sports suited the times well. Marine science was in its infancy; very little was known about coastal water inhabitants. Sharks were considered dangerous and larger sharks like grey nurse were assumed to be man-eaters. Just as today's media assigns a shark attack to a great white, in the 60s the grey gurse was the 'usual suspect'. Catching one was considered heroic and when a dead shark was hoisted up on the beach it drew a big crowd.

'THE ONLY GOOD SHARK IS A DEAD ONE'

Though mostly solitary, grey nurse gather at certain times a year as part of their mating patterns; this added to the confusion as they were perceived as 'shark infested' areas – particularly near public beaches such as Magic Point near Maroubra, in Sydney's eastern suburbs. Predictable gatherings meant grey nurse, compared to other large sharks, were easier to catch or spear.

Later that decade the explosive underwater powerhead was introduced and hundreds of sharks were killed by spearfishers. The impact of this slaughter decimated grey nurse populations on Australia's east coast and also had a compounding effect because it takes between six to eight years for a juvenile grey nurse shark to reach sexual maturity. Once they start breeding they bear a maximum of two pups every second year – so the population grows very slowly even when things are normal. Grey nurse sharks reach a maximum length of around 3.5 metres and are thought to live for about 25 years, so the killing of so many sexually mature sharks in the 60s and 70s threatened to wipe out those that survived unless dramatic changes occurred. It's ironic that what's now known to be a quite docile shark could be hunted to the verge of extinction.

TURNING THE CONSERVATION TIDE

Perception, as they say, is reality... and to change public belief about grey nurse takes exceptional effort. To get politicians to do anything is even harder, but the latter is virtually impossible until the wheels

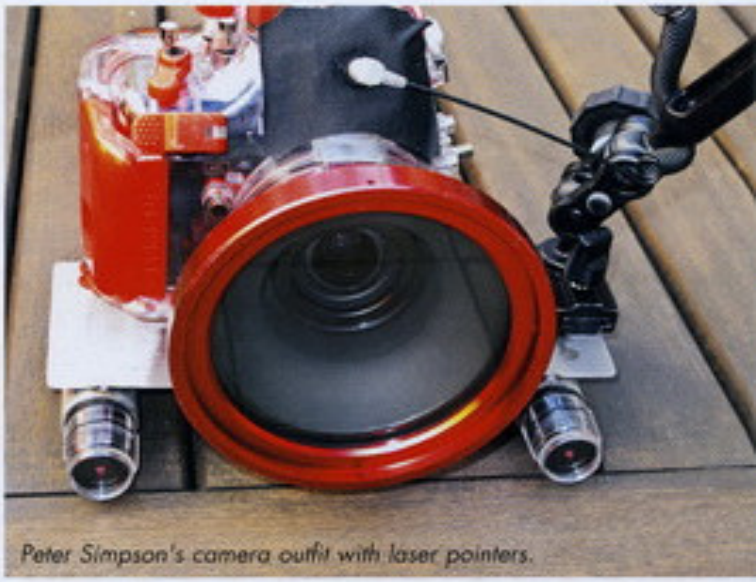
MOSMAN SPORTS STORE

SPOT A SHARK

Sean Barker and Peter Simpson launched *Spot A Shark* in 2009 with the aim of building on the work done by Phil Bowman of Seal Rocks in the early 1990s with his *Grey Nurse Shark Migration Project*. Bowman's project was focused on the use of non-invasive to better understand shark movements and population and *Spot A Shark* builds on this by attempting to harness the large number of previously unrecorded underwater encounters between divers and grey nurse sharks to increase the size of the database. The basic concept is that many divers now carry a camera with them, so if the results of those encounters can be collated and entered into the existing database, a significant step forward may be possible with positively identifying the overall shark population and their migration patterns. The only way to ensure the long-term survival of the grey nurse is to get a full and proper understanding of their actual situation so that programs can be put into place to ensure that survival.

Sean Barker & Peter Simpson.

Sean and Peter are enthusiastically committed to the *Spot A Shark* project and the overall goal of grey nurse conservation, but are quick to point out the significant efforts of others in this field such as Queensland based marine scientist Carly Bansemer, Nick Otway and, of course, Phil Bowman.
www.spotashark.com

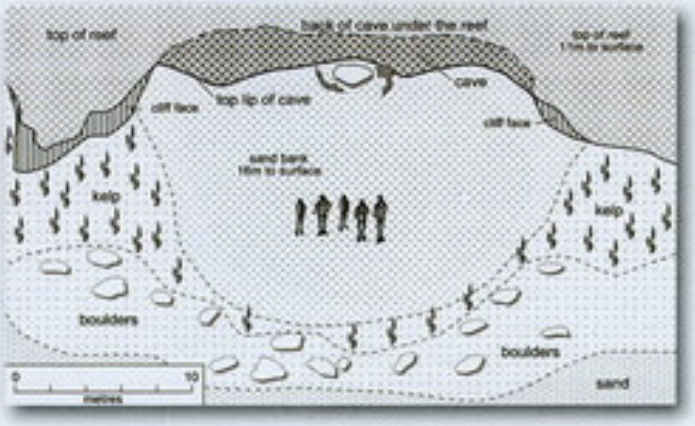

Peter Simpson's camera outfit with laser pointers.

start to turn on the former. Australian diving icons Ron and Valerie Taylor were among the first to realize that grey nurse should be protected rather than hunted, and they both used their high public profiles to enlist an unusual ally to the cause.

Ron, a former world spearfishing champion, told me that when they first started spearfishing in the late 1950s both he and Valerie were sure that the grey nurse was a man-eater. But as they moved more into scuba diving, they discovered it was relatively harmless to man – by the mid 60s they were both campaigning for its protection. Ron highlighted two key events that helped to turn the tide of opinion – the first was enlisting the help of Australian game fishing legend Peter Goadby, who added weight to the conservation argument by confirming that the grey nurse was not a game shark at all. Game fishermen of that era had little interest in environment or conservation, so gaining the support of such a well-known personality as the late Peter Goadby was a huge coup. The second event was the *Vanishing Grey Nurse* film Ron and Val made in 1973, which went to air as part of a series of 13 half-hour documentaries made for Channel 9 titled *Taylor's Inner Space*. It was the first film to challenge public perception of grey nurse and played a significant role in changing attitudes.

Many others also went to great lengths in the fight to protect grey nurse, and in 1984 a major breakthrough came when the New South Wales government formally declared the grey nurse as 'vulnerable' – making it the first protected shark in

Magic Point



Briefing map.>

the world. Queensland, Western Australia and Tasmania eventually followed with fisheries protection legislation; then came a listing as 'critically endangered' under Commonwealth legislation. The highly rated Swiss-based International Union for Conservation of Nature (IUCN) has also listed it as vulnerable, meaning the grey nurse faces a high risk of endangerment in the wild – one step down from high risk of extinction in the wild.

SPOT-A-SHARK

About three years ago I was on ProDive Sydney's diveboat *SeaLife V* one Saturday morning heading for one of my favourite Sydney dive sites, Magic Point. ProDive picked up divers first in Rose Bay on the southern side of Sydney harbour then went north to Manly for the rest. I usually boarded in Rose Bay and was always interested in the other divers as I often saw people I hadn't seen for a while. At Manly, one of the divers had an unusual video camera rig – a regular underwater video housing with a long flat bracket across its top and waterproof laser lights clamped to both sides of the housing. I asked what the contraption was for; its owner Sean Barker was working on a project to identify sharks using I3S – Interactive Individual Identification System – for his Marine Science honours degree. He said I3S was a software program with the basic premise that the pattern of spots on a grey nurse's flanks is unique, as fingerprints are with humans. Therefore if enough images could be collected from known locations where grey nurse gather, then migration patterns could be identified. While the spot pattern remained the same, the distance between the spots increased as the shark grew, so I3S also provided a way to determine the growth rate of a previously identified shark, if the dates it was found and photographed were known. Sean's laser lights were to introduce a known dimension into the image of the shark so that the growth rate could be calculated. Sean said his problem was getting enough images to build a decent database and as a one-man band it was virtually impossible to gather enough to get his project moving.

He'd approached *Dive Log Australasia* seeking support via an advertisement requesting copies and dates of grey nurse shark images taken in eastern Australia. The advert got a strong response and led to Sean teaming up with another Sydney based shark addict, Peter Simpson who'd been diving Magic Point regularly since 2000 and had lots of images useful to this project. Together they developed the *Spot a Shark* website (see sidebar) which greatly increased the number of images in the database. They've now positively identified over 430 sharks and nearly 25 migratory patterns.

FACE TO FACE WITH GREY NURSE

Underwater encounters with any large creature is exciting and the size and physical presence of grey nurse sharks makes interacting with them truly memorable. Most of my experiences, and certainly all my face-to-face contact have been in the cave at Magic Point. Typically you're not allowed to enter the cave because of the potential impact on the sharks, but while taking the images for this article I was allowed to spend a

GREY NURSE SPOT PATTERNS & I3S

Exactly where the original concept of using the spot patterns came in the first place is unclear, but there's no doubt that Australian dive instructor Phil Bowman of Seal Rocks made a major contribution when he incorporated the principle into the PADI specialty *Shark Diver* course he developed in 1987.
I3S was first conceived in 2003 by Dutch marine scientists Jurgen den Hartog and Renate Riejns while in South Africa studying the impact of divers on the ragged tooth (grey nurse) shark at Aliwal Shoal, 40km south of Durban. They were diving with Anna Mieke van Tienhoven, who had published the idea of using the spot patterns on the flanks of the shark as a kind of unique identity fingerprint, but was using manual comparison to do the analysis – which became harder and more time consuming the more sharks she photographed.
Hartog and Riejns developed the theory of using a software algorithm to compare spot patterns, based on the principle that the pattern on each shark is unique. The I3S software they developed stores the pattern as a 'fingerprint file' and uses that to compare each additional image added to the database.
Though initially for use in identifying grey nurse sharks, the I3S software has been used successfully with whale sharks identification, as they also have unique spot patterns, and a modified version has been used in the identification of manta rays.
Website: www.reijns.com/i3s/

GREY NURSE SHARK BREEDING CYCLE

Grey Nurse sharks breed slowly and are ovoviviparous, which means the embryos feed on a yolk sac in the mother's uterus until all the yolk is consumed, when they turn on each other in what is known as "intra-uterine cannibalism". There are upto 15 embryos initially but this Darwinian survival of the fittest process results in only one pup actually making it, meaning a maximum of two pups per litter – one from each of the mother's two uteri. The pups are between 80 to 100cm in length when they are finally born, meaning they are quite small and relatively vulnerable to attack, further adding to the pressure on the overall Grey Nurse population.
The gestation period is believed to be 9 to 12 months and the overall reproductive cycle about two years, because the mother rests for a year or so before mating again.

WHERE TO DIVE WITH GREY NURSE

New South Wales
- Solitary Islands near Coffs Harbour
- Julian Rocks near Byron Bay
- Green Island near South West Rocks
- Fish Rock near South West Rocks
- The Pinnacle near Forster
- Big Seal and Little Seal at Seal Rocks
- Little Broughton Island near Port Stephens
- Magic Point at Maroubra
- Bass Point near Shellharbour
- Jervis Bay
- The Tollgate Islands at Batemans Bay
- Montague Island near Narooma

Queensland
- Wolf Rock near Rainbow Beach
- Flat Rock near Stradbroke Island

reasonable amount of time there after extensive coaching on what and what not to do.

Sean Barker's and Peter Simpson's work with grey nurse has shown that when they aggregate at certain times of the year, they establish swimming patterns that keep them away from each other's 'personal space'. The presence of a large creature like a diver and the bubbles they create can disturb that pattern, stress the sharks and possibly drive them from the area. In a confined space like the Magic Point cave, multiple divers are certain to impact badly on the swimming pattern. A single diver approaching slowly and cautiously can enter the cave area successfully from either end, which minimizes the impact on the sharks and gives them plenty of time to adjust their swimming patterns.

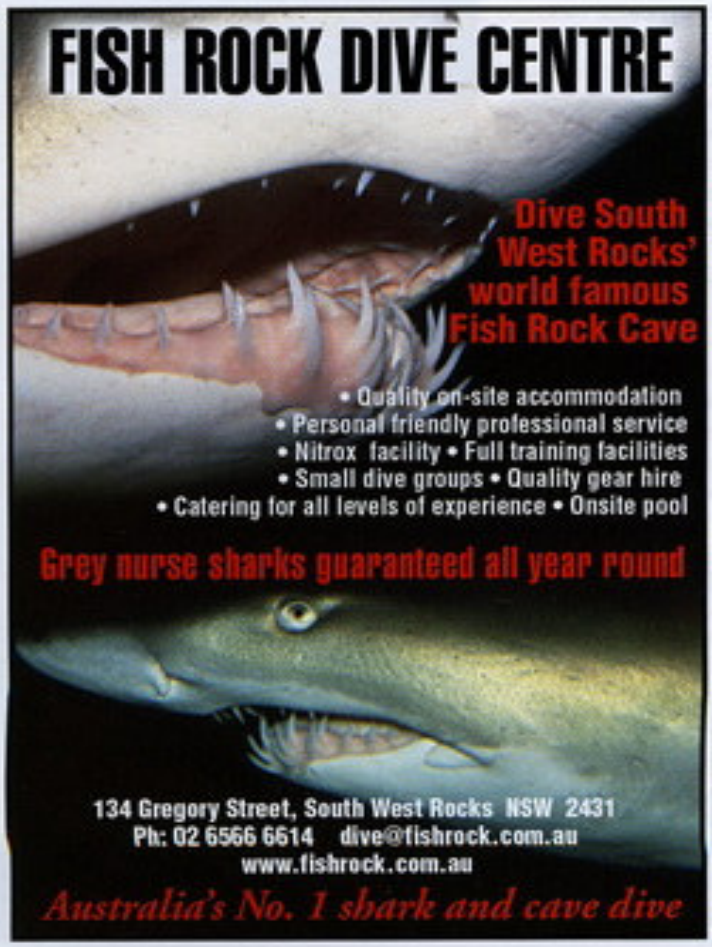
Clear signs of stress are changes in breathing rate, indicated by gaping of their mouths and the speed at which they flick their tails. An unstressed grey nurse will swim in a relaxed manner at a rate that provides enough oxygenated water passing through its mouth and over its gills. A stressed shark has to move faster to increase the flow of water through the gills, and initially 'gapes' its mouth to boost oxygenation. Sean believes the stress threshold is around 24 tail flicks per minute, but the shark's overall body language is a sure sign of stress. If you observe that behaviour, back off and leave them alone – not that you're in significant danger, but they are a big creature after all and common sense should prevail...

The exact patterns of migration, aggregation and mating are still not fully understood, which is why the work of people like Sean and Peter is critical. As divers we're very lucky to be able to see grey nurse in their natural environment – particularly given it's vulnerable status – so we owe it to them to respect them for the magnificent creature they are. ■

WHO TO DIVE WITH

New South Wales

Solitary Islands: www.jettydive.com.au, www.divequest.com.au
Julian Rocks: www.sundive.com.au, www.byronbaydivecentre.com.au
South West Rocks: www.southwestrocksdive.com.au & www.fishrock.com.au
Foster: www.forsterdivecentre.com.au, www.actiondivers.com.au & www.diveforster.com.au
Port Stephens: www.feetfirstdive.com.au, www.prodivenelsonbay.com
Magic Point: www.ProDiveSydney.com, www.frogdive.com.au
Bass Point: www.shellharbourscuba.com.au
Jervis Bay: www.oceantrek.com.au, www.crestdiving.com.au, www.divejervisbay.com, www.deep6divingjervisbay.com
Tollgate Islands: www.indepthscuba.com.au
Montague Island: www.montagueislanddiving.com.au

Queensland

Wolf Rock: www.wolfrockdive.com.au
Flat Rock: www.mantalodge.com.au