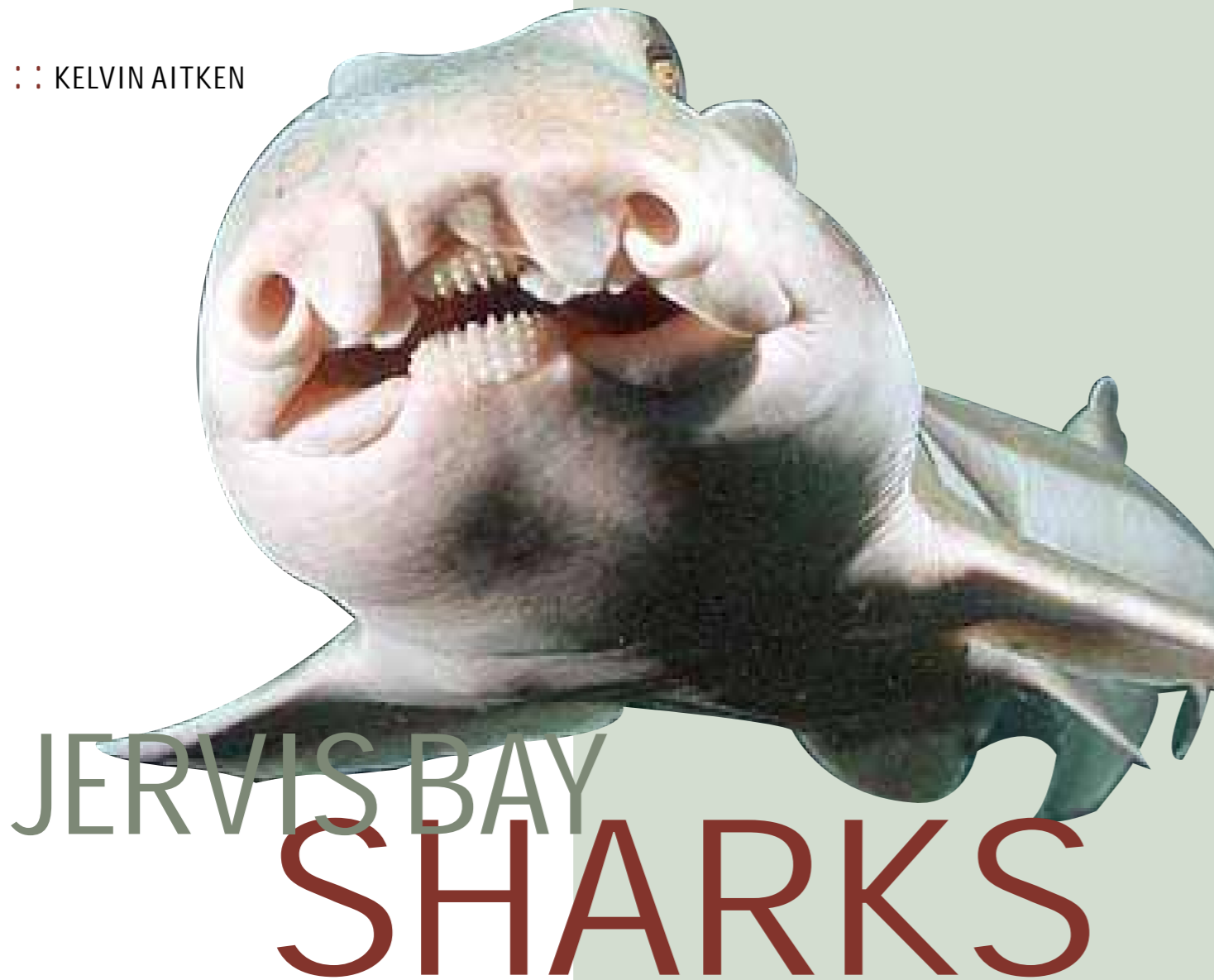


SHARKS ARE WHY I DIVE. THESE AREN'T JUST COOL ANIMALS, THEY'RE ABSOLUTELY FASCINATING. THEIR LIFESTYLE, SENSES, BEHAVIOUR AND BIOLOGY CONSTANTLY AMAZE ME. THEY'RE ALSO A GREAT EXCUSE TO AVOID MOWING THE LAWNS, PAINTING WINDOW FRAMES OR WORKING FOR A LIVING.

::: KELVIN AITKEN



JERVIS BAY SHARKS



While it may not have big tigers and whites other dive spots may provide, JB has a diverse range of sharks. One of my favourites is the Australian Angel Shark (*Squatina australis*). Their common name comes from their wing-like pectoral fins, reminiscent of an angel's wings. These aren't active animals – under normal circumstances they're about as exciting as watching a brick gather rising damp. Buried under a layer of sand they can be very difficult to spot, especially if you don't know the telltale signs.

My first effort at photographing their feeding behaviour took place in Jervis Bay. Adrian Nute, skipper of Huskisson-based liveaboard *Indulgence*, had been trying to interest me in hand feeding cuttles. But with other divers wanting to do the same I took Annie, Adrian's wife and super chef, off to a less crowded area where I knew there were at least 10 sharks scattered over the sandy bottom. On finding our first buried subject Annie

carefully knelt well back on the sand and waited for me to get in position. Snuggling up to an angel shark takes a bit of patience; one animal may tolerate you almost sitting on it while another may take off while you're still a few metres away. Easing in over a couple of minutes to within a half metre is the best tactic. Anticipating a lengthy wait, I made myself as comfortable as possible, composed the shot and waited. Annie started poking around in the sand for something to inspire the shark's interest. Quite often fishing vessels dump fish frames or bycatch in the area and we were hoping to find something to inspire a feeding session.

After about 15 minutes of squinting through the viewfinder, I began to tire. Holding a double camera rig with strobes is no easy task. One of the pesky resident leatherjackets turned up, peering at its reflection in the dome port and generally playing the fool. As it began to swim across the shark, I tensed. It circled the

shark's head, its tiny fins beating to move the ungainly triangular body around. It turned head down, pecking at the sand right next to the shark's eye then moved down to the mouth. The shark totally ignored it, a slight waft of the gills showed it was awake but unimpressed. My whole body groaned.

Then it happened. Annie's foraging in the sand had drawn a large school of stripey and yellow tail scad. Quite often divers feed the fish on our dive site and they'd assumed all the sand scattering meant dinner was on. A swirling trio of scad suddenly appeared in my viewfinder, turned twice, then dropped to the seabed. Fatal. In a nanosecond the shark launched vertically out of the sand and nailed one of the fish. I hit the shutter release, not really seeing what was happening. Annie squawked and flinched back, her eyes as big as saucers. The angel shark propped on the sand with its victim's head protruding from its mouth. A second quick gulp and the head was gone then

another worked the fish down. With an shrug the angel rose from the sand and headed off.

The small fish followed us wherever we went so we tried the same again with the other sharks in the area. Some reacted to the baitfish, some ignored everything and others rapidly swam off without finding out what we were up to. The hardest part, of course, was waiting for the shark to get used to my presence then hoping one of the baitfish would come close enough for the shark to attack.

Left: The convoluted snout of a Port Jackson shark has an enormous internal nasal surface area, allowing detection of even the smallest trace of food or a female's hormones.

Above: A few of the thousands of Port Jackson sharks that converge for the annual mating season wait in a sheltered recess for the evening's feeding and mating activities



Two males push and bite as they try to assert their dominance in a mating 'hot spot' on one of Jervis Bay's shallow reefs.

Centre: Forcing its way out of its protective egg case, a new born Port Jackson shark begins its journey to adulthood which, if successful, will find it migrating back to the same reefs to perpetuate the species.

Bottom: Lunging out of the sand an Australian angel shark nails a small mado in a brief but spectacular display of feeding behaviour

anchor we found a lone male wrestling with a female, biting her on the back near the second dorsal fin. Writhing and twisting, she tried to dislodge him while he manoeuvred for a better holding position. As they tumbled I could see a single spiralled egg case peeking from the females vent. Females are able to extend and retract the eggs from inside the oviduct but during the tussle she stopped short of completely expelling the egg. Saul and I snapped away madly until, with a final mighty wrench, the female dislodged the male and swam rapidly away. The male circled the area before wandering off.

Port Jackson sharks belong to the horn shark family, so named for the sturdy horn-like spines in front of each of the two large dorsal fins and also in reference to the horny crests above each eye. The spines are used for defence but are also employed to wedge the shark into ledges and holes in rough weather. Some adults can be found with their spines ground down to the skin from such use as a surge anchor. The spines vary considerably in shape and height, from blunt knife-like tips to relatively slender needles.

A mature female may travel up to 800 kilometres from her

'trapdoor' held shut by the elastic nature of the egg casing structure and a chemical 'glue'. When ready to hatch, the pup uses the enlarged denticles on its nose to push through the glued doorway, squeezing out of its secure protective home into the hazards of the wide open ocean.

At one time it was thought that the female grasped the freshly laid egg cases in her mouth and pushed them into cracks on the reef to anchor them, but females just dump the egg and swim (or sleep) on with no further care of their progeny. The only time they hold the eggs in their mouth is when they're eating them. For much of the time adult Port Jacksons seem to completely ignore or even avoid the eggs but I've also seen and photographed them munching on the cases, sucking out the nutrient-rich egg yolk and embryo. Most of the egg cases inspected on the sea floor were empty, showing either teeth marks or a small hole drilled in the egg case by a species of marine snail. Egg cases do become lodged in crevices and cracks due to wave and tide action. The bulk of them, though, aren't so fortunate, washing up on nearby beaches after strong onshore winds.



On some dives it would happen within a few minutes, other times I drained an entire tank without result.

Being the first to photograph feeding angel sharks in the wild meant I had to learn what works and what doesn't. By observing their feeding behaviour over recent years I found they were successful in well over half of their strikes, rising about half a metre out of the sand to grab passing fish but leaving anything that was further away. At times they ignored some species such as the well armed leatherjackets with their large protective dorsal spine and favoured others. Bottom dwelling flathead were quickly taken as the sharks didn't need to expend any extra effort to reach up to them. When a shark missed its prey I'd clearly hear their sharply pointed holding teeth gnashing together. Though apparently docile, angel sharks are capable of biting and causing painful lacerations so don't be a Wally; look but don't touch. Some months later Adrian sent down his drysuit for repairs – a moon shaped set of holes uncomfortably close to the crutch area seemed to have been inflicted by an angel shark. When questioned Adrian muttered dark grumbings about the temperament of angel sharks. I rest my case.

Another common shark in Jervis Bay is the humble Port Jackson, probably now the most commonly encountered shark on southern reefs. The wobbegong at one stage had that title but commercial fishing has fixed that. *Heterodontus portusjacksoni* can be found from Shark Bay in Western Australia around the entire southern coast including Tasmania to the southern Queensland border. They've also been recorded from New Zealand but nowhere are

they more common than in the southeast coast around Jervis Bay during the winter months when they come together in mating aggregations. Unlike some other species of shark they're easy to find and work with, though they will bite if annoyed.

To record their reproduction behaviour I again chartered Adrian's boat, ideal for my species specific expeditions with all the gear to keep a diver in the water and well fed to boot. Annie stayed ashore this time, giving Karina the cook only the vaguest indication as to what she was about to face: a mob of Anzac biscuit munching shark shooters. Saul Gonor from Canada joined me along with Bobby Lewis, Mark Priest and Mike Parry. With strong westerlies blowing we dropped anchor at Dent Rock (guess where the name came from) and slipped into the cold soupy winter water. A short swim over sand flats brought a less than spectacular rock formation which housed nothing larger than a bryozoan, but it did have lots of Port Jackson sharks snoozing in the deep cracks splitting the reef.

Normally found sleeping or in a very lethargic state, a fertile female had the males zipping around like grey reef sharks, snuffling among the ledges and reeftop for a chance to mate. They clambered over each other and bumped into us, mouthing strobes and cameras as their large sensitive nostrils sniffed us out. They became more urgent in their movements; one male began biting the other competing males in an effort to intimidate them into leaving. Saul swam with me away from the boat to get clear of the great clouds of silt stirred up by the shark action and Mike Parry's atomic-powered jetfins. There, not far from the

southern feeding areas, either close inshore or out on the edge of the continental shelf between 200-300 metres deep, to her breeding area on the southern and central New South Wales coast. After she arrives she'll lay as many as 16 or more eggs in one winter/spring breeding season. The egg cases are cone shaped with a distinctive spiral flange running from top to bottom. The leathery eggs are dark olive in colour when freshly laid, turning to black and usually encrusted with bryozoans and algae when ready to hatch about 12 months later.

Each egg contains only one pup. The larger diameter top has a

About 12 months after being dropped the eggs 'hatch' producing 20 centimetre pups which begin life as a miniature version of their parents, the main difference being their pale colour and oversized fins. The pups immediately begin feeding on small crustaceans and worms found in the reef and sand habitat in which they live, dispersing into deeper water over the summer where they remain until sexually mature. As they grow larger to adult size, 1.7 metres maximum though usually around 1-1.2 metres, they darken in colour and become much heavier bodied. The large head and oversized fins that make baby Port Jacksons so cute are retained even in mature adult form though maybe not as extreme as the pup stage. Depending on their sex, Port Jackson sharks reach sexual maturity when 8-14 years old.

I've seen pale-coloured adults change overnight to a darker hue so they must have some ability to control their skin colour over a period of time. Besides their pale yellow to dark grey base colour they also have saddle-like dark markings, much like the harness used by seeing eye dogs.

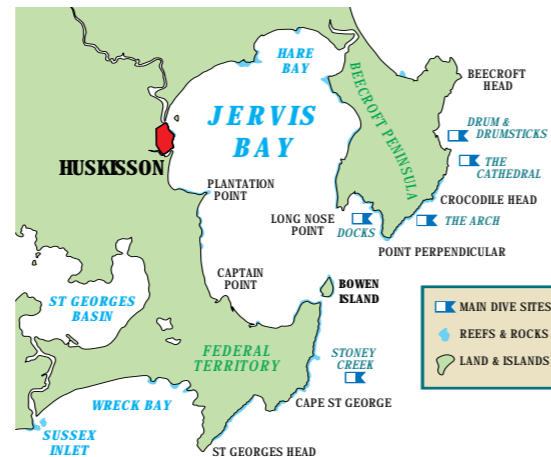
In the eastern states another species of horn shark can be found. Similar in shape and general colour to the Port Jackson, the crested horn shark can be distinguished by the larger crests which end abruptly behind the eye and the lack of the black saddle-like pattern found on the Port Jackson. Instead they have a yellowish tan to brown base colour with a broad indistinct darker band under the first dorsal fin and a small saddle before and after the second dorsal fin. Their reproductive system is also different. Crested horn shark eggs have long sticky tendrils at the pointed end and more compact spirals. Instead of just dumping





Above: I've both seen and photographed egg cases being emptied, the nutrient-rich egg yolk and embryo sucked out. Most egg cases I inspected on the sea floor were empty, showing either teeth marks or a small hole drilled in the egg case by a species of marine snail

Right: Crested horn shark eggs dangle in a tangle off a cluster of sea tulip ascidians, safe from the ocean surges which decimate Port Jackson shark egg numbers.



eggs haphazardly, the female, with the tendrils protruding from her vent, rubs up against vertical bottom growth such as sea tulips or seaweeds so that the tendrils become entangled. As she swims away the two egg cases are pulled from her body. The eggs then remain anchored and will not, unless the anchoring plant is pulled away, wash up on the beach. While the Port Jackson will dump her eggs in very shallow water, the crested horn shark deposits her eggs in less wave impacted reef, usually over 10 metres deep.

During our one week charter we saw mostly male Port Jackson sharks. The females were much larger and their swollen bellies showed they had egg production well underway. On the ocean side of Bowen Island I found a trio of fat females in 22 metres with a few small males either swimming about or resting nearby, maybe waiting for their chance to jump a snoozing female. Because they really have to fight hard to subdue a larger female means that only the fittest and largest males get the chance to pass on their genes.

As I lay next to the females I saw that one had fresh bite marks on her left pectoral fin. After a few minutes I felt a bump and nudge under my arm – it was a male pushing and shoving at my ribs. For a moment I thought it had mistaken me for a supine female. As I moved it followed, pushing its pig-like snout into my BC and armpit. That's when I remembered the fish scraps I'd put in my

pocket in case I found a hungry cuttle, always good for a hand feed. My computer beeped into deco so I pushed off from the bottom, the male following briefly until the draw of the females called him back.

I was keen to find angel sharks and eastern shovelnose rays as well so for some of the dives Saul and I headed out over the sand, carefully scrutinising every bump for the subtle signs of buried critters. We managed to find a few of both, one angel shark sporting a large egg sized cyst or growth on its left pelvic fin. The shovelnose rays were their usual flighty neurotic selves, bursting out of the sand like a scud missile at the slightest hint that we'd spotted them. At the nursery behind Bowen Island we found two of the resident smooth stingrays, the world's largest stingray growing to 350 kg. They were both close to two metres across but looked much bigger. After a rather embarrassing incident three years ago with a small stingray resulting in surgery on my thumb, I greatly respect all rays, especially those with barbed spines and a low tolerance for stupidity.

While most divers journey to Jervis for the rock formations, caves, cuttles and seadragons, there are many other critters there that make the bay unique. The sharks and rays make Jervis Bay very special for me. Fortunately much of the bay is protected by law though it still needs work to protect it from siltation, fishing and pollution from the land. Whether you're new to diving or have enjoyed years of fun in JB, it always provides new experiences that will last a lifetime.