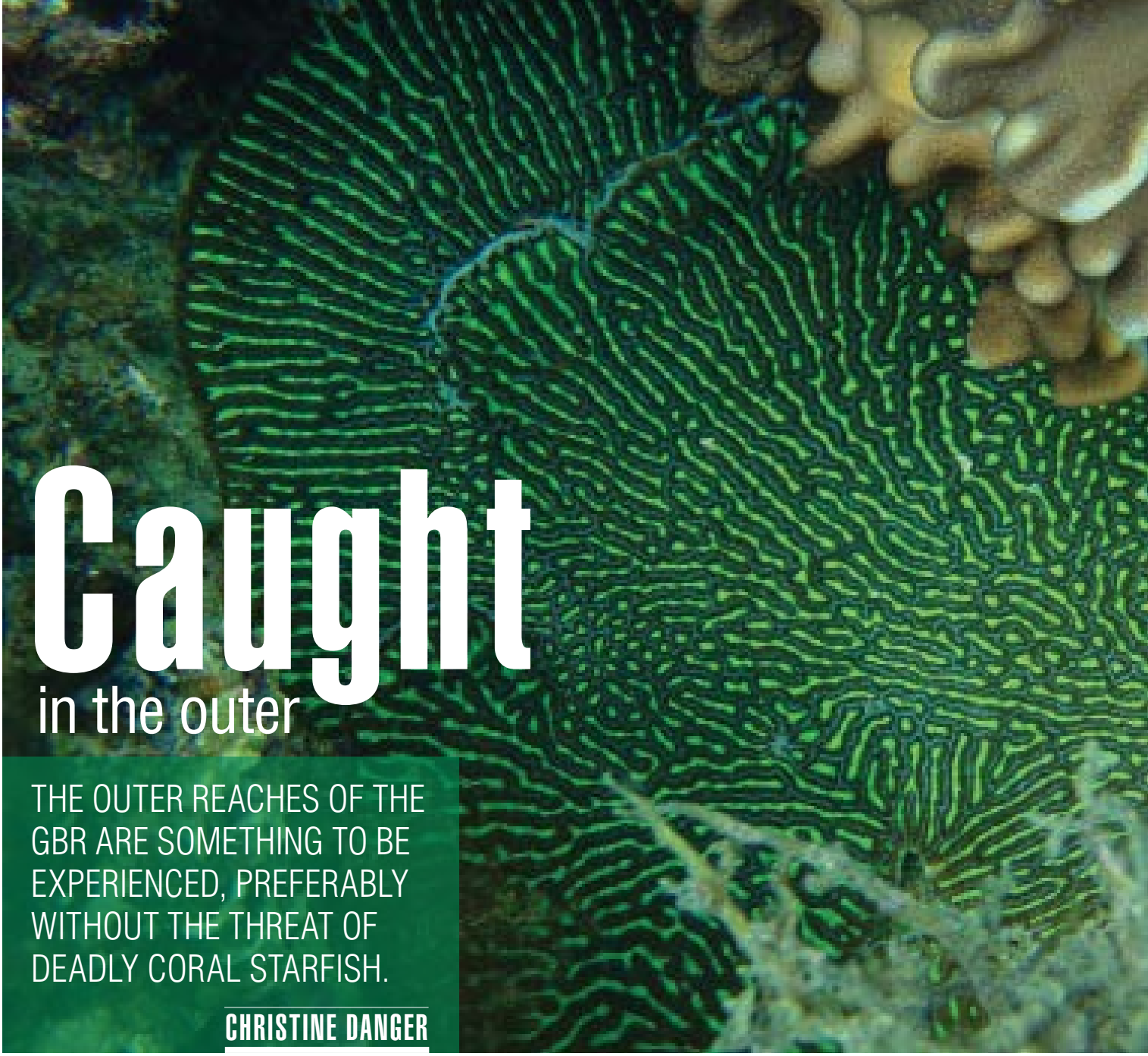


Caught in the outer

THE OUTER REACHES OF THE GBR ARE SOMETHING TO BE EXPERIENCED, PREFERABLY WITHOUT THE THREAT OF DEADLY CORAL STARFISH.

CHRISTINE DANGER

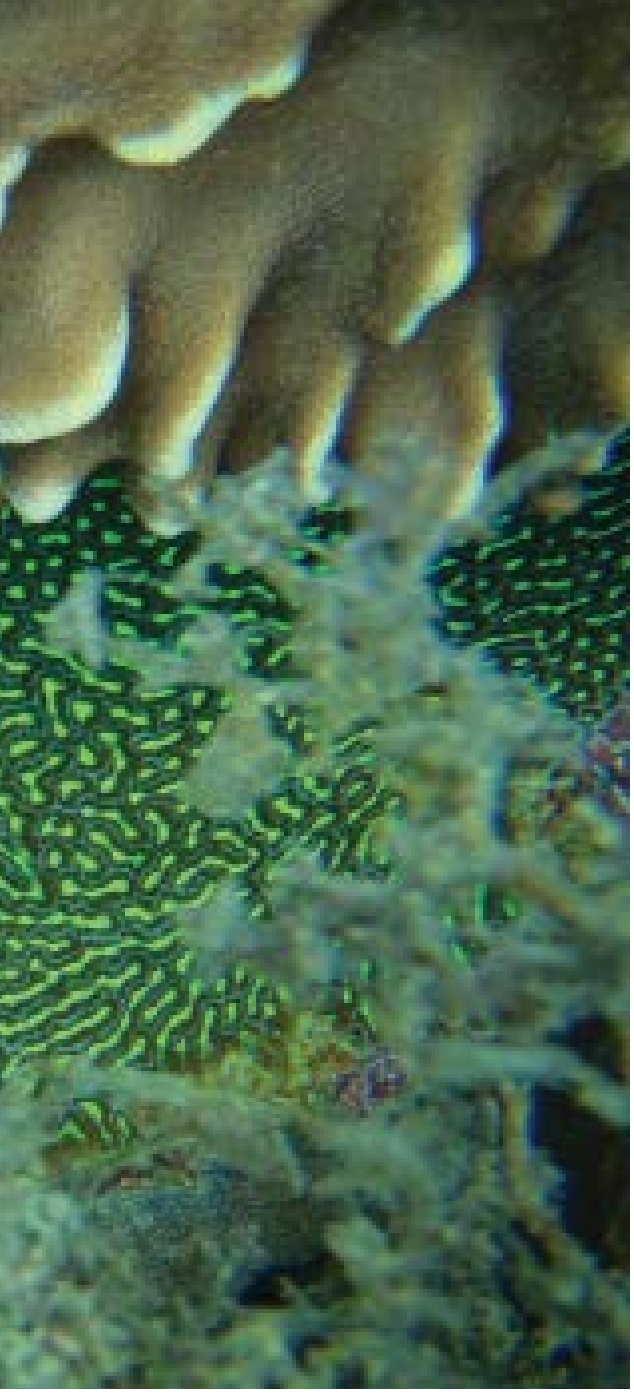
HAVE you ever seen the striking graduations of aqua and blue as you near a tropical reef? What about those amazing wisps of whiteness gleaming out of the turquoise sea, those tiny sand cays on the Great Barrier Reef? If you have, we know you are lusting to get back there and, if you have not, you had better add this to your bucket list.

The 2019 cruising season was for us the first opportunity to sail to Far North Queensland since retiring to live on board. We had one objective: to explore the outer reef as much as we could. We wanted to enjoy its wonders, to go further than we had ever been. We had also heard sad stories about the state of the Reef and we wanted to see it for ourselves.

We have always thought that being at the Reef in strong conditions is not something we want to do: uncomfortable, a little scary and you do not get rewarded for your bravery with any crystal clear, calm waters you need for beautiful snorkelling and underwater photography. So it was that 2019 was not a calm season; so much so that we did not see many other boats out there.

We are not sure whether it was the stronger winds than usual keeping cruisers close to the coast or the Shaggers' Rendezvous on Gloucester Island attracting over two hundred cruisers; but we spent a lot of time on the outer: on our own, away from everybody, on the Outer Reef off the beaten track.

We spent 43 days at the Middle to Outer Reefs. It may not sound like a lot: 43 out of a possible 184 days; but the rest of the time we were still floating or sailing along the Great Barrier Reef, just closer inshore.



MAIN: Sponges filtering litres of water at Homestead Bay, St Bees.

ABOVE: Sunsets don't come any better than at Thomas Island.

We are keen snorkellers and underwater photographers and have the best time engaging in our passion in the crystal clear waters of the Reef. But the two big challenges with spending time at the Reef are picking the right weather and finding a safe spot to stop at. We did lots of exploring during the 2019 season and found that a combination of settings worked for us.

THE RIGHT COMBINATION FOR US

Everyone will tell you that at over 15 knots of breeze, it gets uncomfortable out at the Reef: you get tossed around and there is little protection, especially at high tide when several metres of water cover the reef flat. During tradewind season the south-easterlies blow fairly relentlessly, which also happens to be the time when most cruising yachts head to the tropics.

What we found in 2019 was that the calm days below ten knots were few and far between. So much so that if we wanted to see the Reef, we had to put up with less than ideal weather conditions.

When we look back at our cruising notes and tally up the days they show that between the beginning of May and the end of October, we had 16 days of calm conditions with less than ten knots of breeze. The rest of the time it was blowing at 15kn to 20kn, with peaks at 25 kn to 30kn.

Our notes also show that most of the time we spent at the Reef was in 15kn to 18kn. Bear in mind we are on a 52 foot catamaran. It moves in the chop, but not as much as smaller cats or monohulls. So we became adept at looking for spots offering the best protection possible for those prevailing conditions.

We found that the middle to outer reefs with a sand cay, a public mooring and within 30 to 40 miles of the mainland for easy returns to shelter, offered us the best combination.

If you look at a map of the Great Barrier Reef, particularly as you head further north of Townsville, the GBR gets closer to the coast. Off Cairns and Port Douglas for instance, the furthest offshore you have to travel to be at the outer reef is 30 miles, whereas down south, you may have to travel 90 miles: to the Swains for example.

The close inner reefs and fringing reefs around islands close to shore, are badly affected by coastal run off, often covered with filamentous algae with hardly any coral left even if there is still some fish life. The water is turbid and clarity poor.

The far outer reefs offer the best water clarity and, therefore, visibility underwater, showing no detrimental effect from coastal runoff; plus limited rubble from cyclone damage. Corals might not be as dense as they used to be, but they are healthy or recovering and you still have the option of a relatively quick return to shelter if the weather turns.

Enter a green zone, where no fishing or take is allowed, you find more fish life, which are also less nervous about a human presence.

Another aspect we noted was that the more central reefs have the advantage of offering slightly more protection because of the layering effect of a reef within a reef. For instance Michaelmas Reef sits in the shelter of Arlington Reef. Then add a sand cay and, although these islets are only two or three metres above sea level, ten or twelve if they are vegetated, they provide an extra break from swell and chop.

ANCHORING VERSUS MOORING

Once you find the spot, should you anchor or do you pick up a mooring buoy? There is a bit of debate among cruisers as to what is the best when at a reef.

Some would rather use their own ground tackle, knowing exactly the state it is in. But, as far as we are concerned, the enemy at the reef is getting your anchor chain caught on isolated coral heads.

You might be able to manoeuvre the boat around to get the chain free, but you might not; if this happens in really deep water you need diving gear to get freed up, unless you can free dive. Which we cannot!

> "ALL THEN BEGIN THE DESTRUCTIVE FEEDING FRENZIES, LIQUEFYING THE CORAL TISSUE."

If we can find a large enough patch of sand, free of coral heads and not too deep, we anchor. We tend to look for a location in six metres to ten metres of clear water over sand at high tide, crystal clear so we can see the bottom. We put out 30m to 60m of chain and then we dig in the anchor by reversing hard and set our anchor alarm. You do not want to drag at the reef.

When we do find a spot, we mark it on our GPS for future reference. Also, to be sure to be sure, we dive down to the anchor to check the bottom.

But on the whole, give us a public mooring buoy any time. The Great Barrier Reef Marine Park Authority have installed quite a number

of public mooring buoys, colour coded to show their class: maximum length of vessel and maximum wind speed limits.

We use the green or blue moorings, which are also the most numerous. They are regularly maintained, they are often close to the best dive spots and close to the reef wall. They are generally worry free and are there to protect the coral from anchor chain damage.

I say generally because we have had one instance when a poorly spliced loop gave way in the night at Norman Reef. We realised fairly quickly as our anchor alarm on our AIS sounded when we started to drift out of our safe circle.

Here is a hint: even on a mooring, use your anchor alarm. It might save you from serious trouble, as it did for us.

But, despite this incident, we always favour the public mooring buoys over anchoring. We do not hook on blindly: we systematically dive on the mooring to check its condition.

To find out about public buoy locations, go to the GBR Marine Parks website: www.gbrmpa.gov.au/access-and-use/moorings and download the PDF for the region you are interested in.

HOW DO WE DECIDE WHERE TO GO?

To search for good spots to explore we rely on:

- the Great Barrier Reef Marine Park charts
- the public mooring access PDFs for different regions
- Google Earth for satellite images
- MotionX-GPS phone app for satellite images, routing and waypoints
- Navionics charting software for charts, routing and waypoints
- word of mouth from other reef explorers.

Because, typically, you do not have much internet at the Reef, it takes some preparation ahead before leaving the coast.

We scout around, get on the internet and search for information on various reefs, download aerial pictures or take screen dumps of satellite images for areas we are interesting in exploring, mark spots on the apps. If we find there is a public mooring there, there is no holding us back.

But, for more remote spots or less frequented ones where you will have to anchor, the satellite images help you work out the lay of the reef, the look of the sea floor, whether there are patches of sand big enough to drop the pick in away from bommies and at what rough depth.

Whenever we meet cruisers at the Reef, we tend to exchange information. We never ask nor give precise GPS anchoring coordinates. But the few people you meet out there are keen reef-hoppers like us. We readily share general information about the attractiveness of certain reefs, the accessibility and ease of anchoring. Mostly, that is sufficient to put in the planning mix.

And then it is a matter of going there! So now that we have revealed all our secrets for staying 'on the outer', let your reef hopping begin. We will share our top six locations in North Queensland with you, listed from the southernmost to northernmost.

ABOVE: Back from the beach: that's my home!

OPPOSITE PAGE: Scawfell Island as we sail away.

TAYLOR CAY

Some 30 miles east of Dunk Island, Taylor Reef is a stunning spot. We were lucky to be there on one of those rare calm days and the graduation of colours from ultramarine to turquoise was to die for. It is one of those 'pinch yourselves, we are really here' spots.

Anchoring at Taylor Reef is stress free in 7m of aqua water over sand at high tide, with a large area totally clear of bommies. There is a sizable cay which attracts a lot of sea birds such as black-napped terns, brown boobies and noddies.

With the reef being in a green zone, you can see the effect on the marine life: abundant fish species and not too worried about people.

But what is most striking at Taylor Reef is the attractive coral gardens. More than at any other reef, you will see many odd dwellers such as the tunicates and the crinoids as well as the beautiful red gorgonian fans.

An interesting fact shared with us by locals from Mission Beach is that Taylor Cay exchanges

RIGHT: The views from the Thomas Island northern anchorage are to die for.

BELOW: Colourful underwater surprises at Goldsmith.

sand with nearby Beaver Cay from year to year. At times Taylor Cay disappears all together at high tide, while Beaver Cay expands. When we were there it was Beaver Cay which played shy and only poked its sandy head out at low tide.

SUDBURY CAY

Offshore of Fitzroy Island, Sudbury Cay is the centerpiece in one of the most beautiful reefs near Cairns. There are two public moorings and lots of sandy clear patches to anchor in 10m to 12m of crystal clear water.

As with most reefs with a sand cay, snorkelling and diving happens in fairly shallow waters but the reef system here is home to marine life you would expect to see at much deeper sites. With masses of soft corals swaying in the current, weird feather stars, lots of parrotfish who cannot help but dive bomb your underwater photos, poking their fins at every opportunity, it is a delight to explore.

Then there are the endearing green sea turtles. I spent a fair bit of time swimming with one particular turtle who kept coming back to me. I suspect he was utterly bewitched by my figure hugging wetsuit, finned feet and oh-so-sexy snorkel!

Sudbury is another one of those sights that will erase all your worries in a nanosecond. Down below, there are no bills to pay, no project deadlines, no boat repair task list; once you are below the waterline, nothing else matters, you are in this very moment.

MILLN REEF

Not very far from Sudbury, but a bit further offshore, is the absolute splendour of Milln Reef. The colours at low tide are just mesmerising.

It is an easy 30 miles sail from Cairns and, if you are lucky, there is a free mooring when you get there or you can squat on one of the tour operators' buoys.

We went to Milln Reef several times and were generally on our own, apart from the occasional dive boat visit. Anchoring is in deep water: 18m plus, too deep for our liking. But tour operators have several moorings, which can be used if they are vacant.

What we found there were lots of big fish: some colourful and pretty, others like the green humphead parrotfish only a mother could love! There is a maze of trenches where a multitude of

big and small fish patrol. It is great fun to swim along these gutters; sometimes you get through to different areas, other times you reach a dead end and have to turn around. The seascapes are stunning. All this in the middle of a huge expanse of hard and soft corals.

What a treat: no rubble, no bleaching, no crown of thorn starfish.

FLYNN REEF

One of the outermost reefs on the edge of the continental shelf and the Coral Sea Trench, Flynn Reef is one of our favourites. We spent several days there.

Because of its location, it feels remote, wild; it feels deep, immense; it feels different from every reef we have been to with its great visibility and dramatic underwater seascapes.

It is the sheer size of what you are navigating through that seems most striking here: huge boulder corals, terraces of coral plates, deep trenches, big drops and all surrounded by deeper water. You do have to dive down further, but it is so worth the effort. The water is so blue and so clear.

There is one public mooring and several tour operator moorings. Anchoring is in deep water, 18m, so it is best to pick up a mooring.

MICHAELMAS CAY

Michaelmas Cay is a small low sand islet on the western tip of the Michaelmas Reef. It covers an area of 1.5 hectares and rises to the dizzy height of 3.5m above sea level.

As you approach the sand cay, you are astounded by the number of birds and the noise level; plus the smell of guano! There are so many birds that, at a distance, it looks like a black cloud hovers over the sand. With 20,000 pairs of seabirds recorded nesting at Michaelmas Cay it is no wonder.

The cay is an extremely important nesting habitat for migrating birds, the largest in the Southern Hemisphere. People often come to Michaelmas Cay for the birdlife, more so than the snorkelling. You will see brown boobies with the males odd blue beak and green feet, lots of sooty and bridled terns, beautiful common noddies; even a frigate bird or two. It really is a special spot for birdwatching.

"ONCE YOU FIND THE SPOT, SHOULD YOU ANCHOR OR DO YOU PICK UP A MOORING BUOY?"

The sandy lagoon next to the cay is one of the rare spots that are wind protected. This is because it is sheltered by not only Michaelmas Reef and cay, but also Arlington Reef. There are two public moorings close in and space to anchor in clear water over sand a little further out.

You can also hook onto the moorings of several tour operators when not in use. They are well maintained. You just have to be prepared to vacate if the tour boats turn up.

The coral is immediately adjacent to the beach. The waters around the cay are a haven for turtles resting and foraging all over and have a rich marine fauna including giant clams.

Another cool thing: dozens of schooling batfish mingle under your hulls. It is great to jump off the back of the boat and join in the action. They are really inquisitive, swimming under you, around you, at you, totally unafraid. The black trevallies are very tame too, even if a little more daunting when they come close.

MACKAY CAY

On most days, you will see the rainforest covered range along the mainland while enjoying the cay and snorkelling this reef. It is that close. Yet it is such a different world out on the Reef.

There are two public moorings there, as well as ample space to anchor in 10m to 12m of water over sand, clear of coral heads. You can go and admire your yacht from the sand cay top at three metres, which gives you a different perspective on your surroundings. The colours of the reef will take your breath away.

Hopping into the clear water and seeing what lies beneath is one of those 'OMG' moments. We have snorkelled at dozens and dozens of sites, but Mackay Reef, particularly around the reef wall drop off, impressed us. There are giant clams in neon shades that hardly seem real; Nemos, yes you will find him and his family in their favourite anemone, plus the usual array of colourful parrotfish and surgeonfish zooming in and out of ledges and hidey holes. While the larger pelagic species patrolling on the outside.

As Jacques Cousteau once said: "The sea, once it casts its spell, holds one in its net of wonder for ever." We are totally hooked and hope we will have many years of exploration at the Great Barrier Reef.

We also hope that this article will inspire you to spend time there, even if the conditions are not ideal. It is so worth the effort and it might not be there forever.

It should be compulsory for every single politician and policy maker to go snorkelling on the Great Barrier Reef because it is hard to imagine not wanting to do everything you can to protect and preserve it once you have spent time on it.

On that point, I would like to finish this story with a look at one of the Reef's greatest dangers.

A GIANT THORN IN THE REEF'S SIDE

We are sailors, snorkellers and underwater photographers. We are captivated by marine life and spending long spells at the Great Barrier Reef is a favourite occupation. We have seen so much, yet still have so much to see.

Most of the marine life we come across is a source of delight. But, in October 2019, we saw something that shocked us.

Walker Reef, offshore of Hinchinbrook Island, was our first experience at witnessing the damage inflicted to the reef when the crown-of-thorns starfish (COTS) attack hard coral in large numbers. We had seen isolated COTS only once before, at Hook Reef, offshore of the Whitsundays. But this time it was a disturbing sight which sent us on a quest to do something about our find. It started with learning more about these voracious coral eaters, then reporting sightings and enquiring about individual action we could take. So here is what we discovered.

WHAT CROWN-OF-THORNS STARFISH LOOK LIKE

Crown-of-thorns starfish are the largest specie of starfish. It gets its name from thorn-like spines that cover the upper surface, resembling the biblical crown of thorns. Generally, they are 25 centimetres to 35cm in diameter, but can be as large as 80cm with up to 23 radiating arms.

Most of the ones we saw had 13 to 15 arms. Like other sea stars, if it loses an arm it can regenerate it in about six months.

Covered with big venomous spikes, COTS are toxic to both marine creatures and humans. The thorns are sharp and can penetrate through a wetsuit or glove inflicting venom, inducing sharp pain, swelling, nausea and vomiting.

Look, but do not touch!

Although the body of the COTS has a stiff appearance, it is able to bend and twist to fit around the contours of the coral on which it feeds.

FEEDING FRENZY

Crown-of-thorns starfish feed on branching and table corals such as Acropora species rather than more rounded corals with less exposed surface area, such as Porites.

Like other starfish, it exudes its stomach to start the process of digestion outside its body. It will settle on a piece of hard coral then release chemicals, which attract additional COTS to the healthy reef sections. All then begin the destructive feeding frenzies, releasing digestive enzymes onto the reef, liquefying the coral tissue.

When diving you will notice the white coral skeleton, the scar, where they have digested the polyps as it moves around and eats its way through an area. The coral skeleton is then rapidly infested with filamentous algae. An older scar will look brown or grey.

During a severe outbreak, there can be many crown-of-thorns starfish per square metre, even piling on top of each other. It can eat so much that it kills most of the living coral in that part of the reef, reducing hard coral cover from the usual 25 per cent to 40 per cent of the reef surface to less than one per cent.

BELOW: The best views from Gap Beach, Lindeman, looking towards Pentecost Island.

ABOVE: Blue tiger butterflies flutter in their thousands on any of the islands.

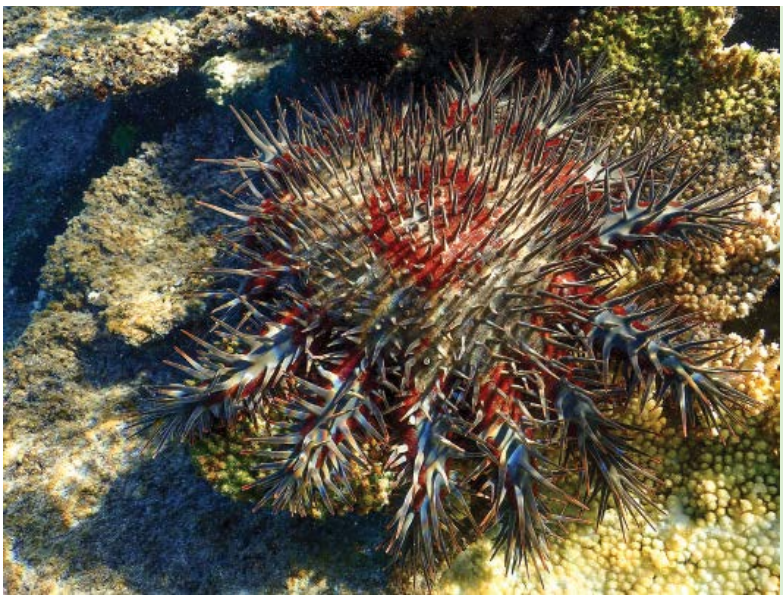


IMAGE: GBRMPA

Such a reef can take ten years or more to recover its coral cover.

THE THREAT THEY POSE

In a healthy reef and in small numbers, crown-of-thorns starfish play an important role in a reef ecosystem. It can prevent the fastest growing corals, such as branching and staghorn corals, from taking over slower growing species like boulder shaped corals. They keep biodiversity high and enrich the environment.

One COT in a hectare area is what is considered a normal, low risk number. Imagine a rectangle 500m long and 20m wide, or a square with 10m sides and put one COTS in there and you get the picture.

But, like other animals that have caused problems when populations explode, it is when they reach plague proportions that it becomes a pest. In an outbreak, which is defined as at least 30 COTS in a one hectare area or when they consume coral tissue faster than the corals can grow, they inflict significant damage to the reef.

What we saw at Walker Reef was an infestation of about 30 to 40 COTS in maybe half a hectare. So it was concerning.

With the cumulative effect of other threats such as climate change, coral bleaching, tropical cyclones and decreased water quality, which weaken the Great Barrier Reef's resilience and threaten its survival, it becomes increasingly critical to address the impact of COTS predation.

Here is what makes COTS such a menace:

- they eat 250 square centimetres of coral per night, or about a body diameter
- they prefer plates and branching corals, which are already susceptible to bleaching
- females are extremely fertile and produce two million to 65 million eggs per spawning season, December to February, depending on size
- they grow rapidly, getting to maturity quickly to easily reach outbreak densities
- they are cryptic, meaning they hide in the reef during the day and are hard to see, but they are active at night, moving at up to 20m an hour
- COTS predators: the giant triton snail, Maori wrasse, starry pufferfish and titan triggerfish, have greatly decreased in numbers through over fishing.

CROWN-OF-THORNS STARFISH CONTROL PROGRAM

The Australian Institute of Marine Science runs the long term monitoring program on the Reef, which looks at a range of aspects including crown-of-thorns starfish.

This program has shown that outbreaks have begun in the north and migrated southward over about a 15 year period, with ocean currents transporting larvae between reefs.

The surveys also show that healthy reefs generally recover between outbreaks, taking 10 years to 20 years to do so. However, recovery takes longer on reefs that are affected by additional stresses such as: coral bleaching, cyclones or poor water quality; so the coral may not fully recover before the next wave of outbreaks occurs.

The Great Barrier Reef Marine Park Authority (GBRMPA) oversees a COTS control program.

LEFT TO RIGHT: The crown-of-thorns starfish are coral killers, they move fast at 20 metres an hour.

Diver injecting and safely removing crown-of-thorns starfish in the Great Barrier Reef region.

The result of COTS predation: dead coral. It can eat its own body area in coral each night.

ACKNOWLEDGEMENT TO COUNTRY

Cruising Helmsman acknowledges the traditional owners of the country mentioned in this story: the Bayali, Bindal, Darumbal, Djirbalngan, Giya, Gureng Gureng, Guwinmal, Nyawaygi, Wargamaygan, Yidinjdji, Yuru and Yuwi peoples and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

This is a combined surveillance and culling program involving a number of licensed vessels along the Reef and a team of divers.

High profile individual reefs, such as those used by the tourism industry, have been protected by divers injecting COTS with poisons. The best practice method for undertaking COTS control is to use a modified drench gun to inject the starfish, using bile salts, sodium bisulphate or household vinegar. These injection methods minimise the risk of breaking corals and are safer than manual removal, which is not recommended due to the risk of spiking.

Although direct injections are toxic to COTS, these solutions are not known to have a residual environmental impact. Over 900,000 COTS have been killed by injections by divers.

HOW WE CAN HELP

If, like us, you are recreational users of the Reef and want to take part in measures to help reduce its threats, there are things you can do.

1 Download the 'eye on the reef' app on your smartphone. This app has information on marine park zoning showing where you are in relation to different zones with information on seasonal closures for harvesting of certain species. With it there is no excuse to be dragging a lure or fish in a green zone. If you do, expect to pay a hefty fine.

2 Importantly, the Eye on the Reef app allows you to record and report sightings of marine species: both your favourites such as whales and the nasties such as the crown-of-thorns starfish. Your latitude and longitude are recorded and immediately sent to surveillance vessels, which can prioritise interventions such as culling.

3 Learn about culling techniques that are used to respond to COTS outbreaks and consider volunteering to help control these on the Great Barrier Reef, including applying for a permit to conduct culling yourself.

We found the GBRMPA incredibly responsive. Within a few minutes of recording a sighting on the app, we were contacted by phone to discuss our findings, confirm location details and give us information on possible further action.

Few cruisers have the availability to take part in cullings, but every cruiser can report sightings of invasive species and, judging from the GBRMPA response to us, recreational users' reports are taken seriously and acted on swiftly.

It is easy for all of us to keep an eye on the Reef and help protect it. So if you see crown-of-thorns starfish in high density in your travels, do something useful and report it.

Everyone's actions, whether big or small, to reduce threats and restore condition will improve the Reef's outlook. ≈

CHRISTINE DANGER

Chris and her partner Wade Bishop have been sailing on catamarans of various sizes for about 20 years, cruising Bass Strait, Tasmanian waters and Australia's east coast. In July 2017, they finally retired, and became sea wanderers. After spending many years on Take It Easy, they acquired their 'last' catamaran, Anui, a 52ft Crowther and enjoy the added speed and comfort. Follow their adventures on www.sv-anui.com.