Snail threat to Ningaloo Marine Park?

During the late 1980s an outbreak of the marine snail drupella sparked fears for the future of Ningaloo Reef. The snail devastated large sections of the reef by killing its coral. By the mid-1990s the outbreak had subsided and concerns eased—but what is the status of drupella in Ningaloo Marine Park today?

by Samille Mitchell and Shannon Armstrong

In the early 1980s locals first raised alarm bells about the state of coral communities in the northern section of Ningaloo Marine Park. Great tracts of the reef were dying, suddenly turning stark white (see 'Fatal attraction', *LANDSCOPE*, Winter 1989). A 100-kilometre stretch of reef was said to have lost an incredible 90 per cent of its coral. The culprit? An inconspicuous looking marine snail known as drupella (*Drupella cornus*).

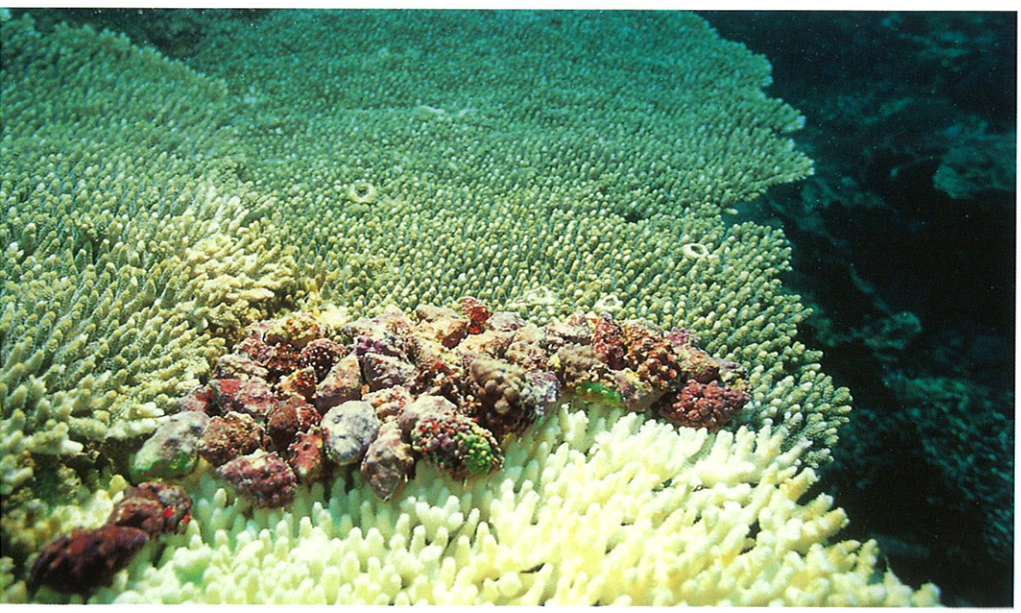
For reasons still open to debate, drupella populations had increased dramatically. In army-like fronts, lines of the snail moved across Ningaloo's dazzling corals, using their modified mouths to suck out polyps from their coral homes.

Monitoring drupella numbers and effects

Scientific attention ensued. In the late 1980s the Department of Conservation and Land Management (CALM), now known as the Department of Environment and Conservation (DEC), conducted a major survey of Ningaloo Reef and found coral cover in the back-reef zone where the snail was most prominent had been reduced by more than 75 per cent in two-thirds of the reef.

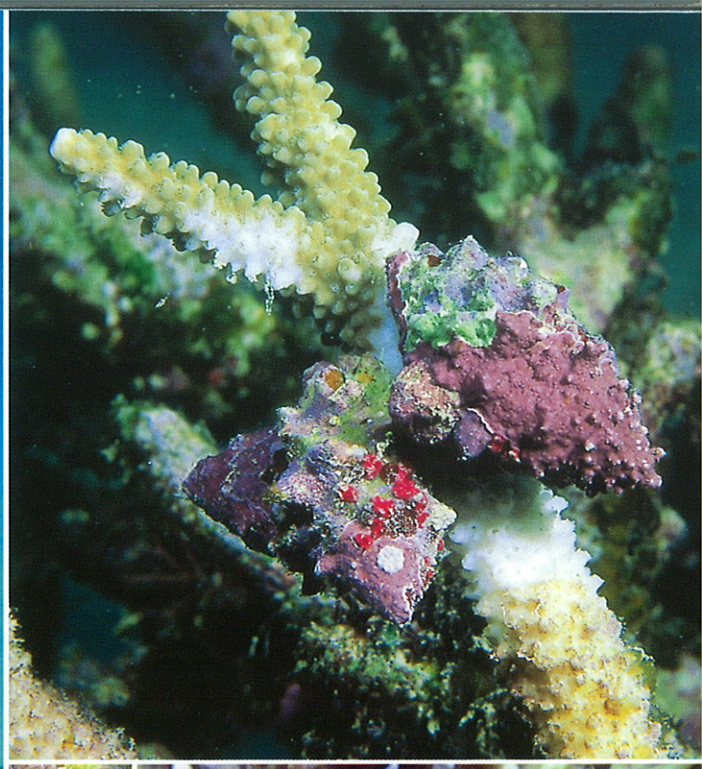
CALM conducted another survey in 1991, which involved monitoring 13 locations in the Ningaloo Marine Park. By this time drupella numbers had decreased, but remained a worry. A follow-up survey in 1994, however, found populations had dropped considerably. The problem had subsided as fast as it began.

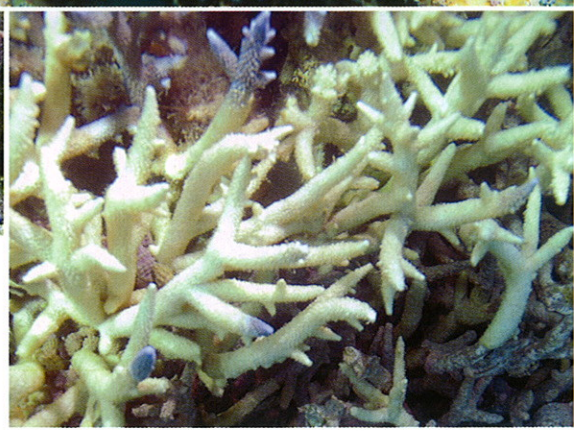
These surveys involved many volunteers and CALM staff and were expensive and time-consuming



Above Reef colony partly destroyed by drupella.
Photo – Gerhard Saueracker/Lochman Transparencies

Left Drupella feed on coral leaving a bleached skeleton.
Photo – Eva Boogaard/Lochman Transparencies





Top right Drupella snails feed on staghorn coral.
Photo – Gerhard Saueracker/Lochman Transparencies

Right Denuded coral skeletons.
Photo – Shannon Armstrong/DEC

to organise and run. A new, more cost-effective method was needed to continue monitoring this voracious coral predator while maintaining the integrity of the historical data.

In 2005, Honours student Shannon Armstrong developed a new cost-effective drupella monitoring protocol and resurveyed the original 13 drupella monitoring sites in Ningaloo Marine Park. This provided an update on the status of drupella abundance and the health of coral communities in the park.

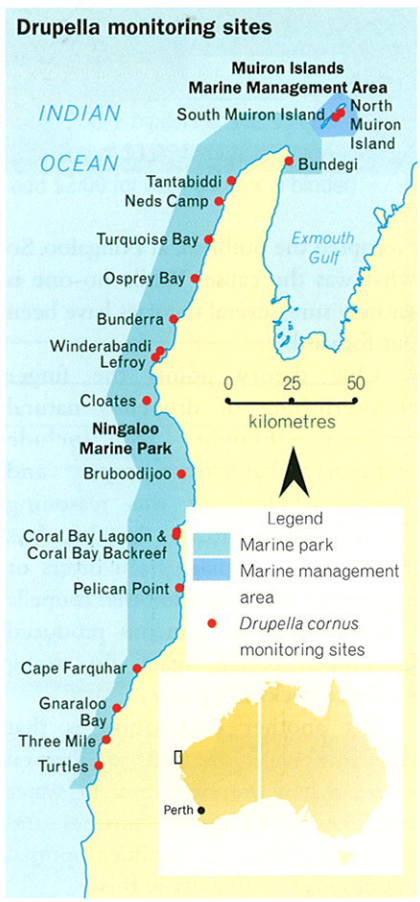
After joining DEC's newly formed Marine Science Program in 2006, Shannon established another six 'new' drupella monitoring sites to cover the area resulting from the 2004 southern extension to the Ningaloo Marine Park and gazettal of the Muiron Islands Marine Management Area. Shannon's 2005 and 2006 surveys found drupella numbers continued to remain in check since the population explosion of the late 1980s and early 1990s.

While the positive results of the 2005 and 2006 surveys are good news, there is no room for complacency. A strategy in the revised Ningaloo Marine Park Management Plan 2005–2015 states that drupella abundance and the health of the coral communities will be surveyed at least every three years. The next major survey is planned for 2008.

What caused the outbreak?

The most puzzling facet of the Ningaloo drupella outbreak was its cause. Outbreaks in other areas across the world, like Japan and the Philippines, have been attributed to reef siltation due to heavy rainfall, dredging or coastal development. Consequent increases in nutrients in the water may have stimulated phytoplankton growth, providing drupella larvae with increased food supply. This in turn may have increased the survival chances of drupella larvae and thus resulted in larger numbers of drupella recruits. Within two to four years the drupella recruits could have grown to reproductive size and the effect of their predation would emerge.

But with its low rainfall and lack of development, it is doubtful such factors



Above left Ningaloo Reef.
Photo – David Bettini

Above Monitoring reef health.
Photo – Suzanne Long/DEC

Left Measuring drupella.
Photo – Shannon Armstrong/DEC

prompted the outbreak at Ningaloo. So what was the cause? While no-one is entirely sure, several theories have been put forward.

One theory points the finger at overfishing of drupella's natural predators—thought to include emperors, baldchin groper and octopuses. However, this reasoning has not been proven. Another lays the blame on damage from divers or boats, with the suggestion that drupella is attracted to the mucous produced by broken corals. Again, no strong evidence backs this theory.

Yet another explanation is that such outbreaks are part of natural cycles, when the right mix of water temperature, settlement surfaces and currents occasionally produce optimal conditions for drupella to thrive.

Managing a future outbreak

While drupella numbers currently remain in check, any future outbreaks would again place the reef in jeopardy. But is there a need to intervene? And, if so, how could numbers be curtailed? There is no clear cut answer. If the outbreak was indeed a natural process, should nature be left to run its course? Studies have already shown that picking the snail by hand is fruitless. It would take sustained and intensive effort to make even the tiniest dent in outbreak populations.

So, for now, managing drupella is a matter of monitoring its population and gathering information in the hope of understanding more about this small coral predator. Armed with more information, DEC may be in a better position to manage any future outbreak, should one occur.

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The establishment of the Marine Science Program in May 2006 represents a significant increase in DEC's capacity to provide a strong scientific foundation for the management of WA's world-class system of marine parks and reserves and for the conservation of the State's unique marine biodiversity.

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