



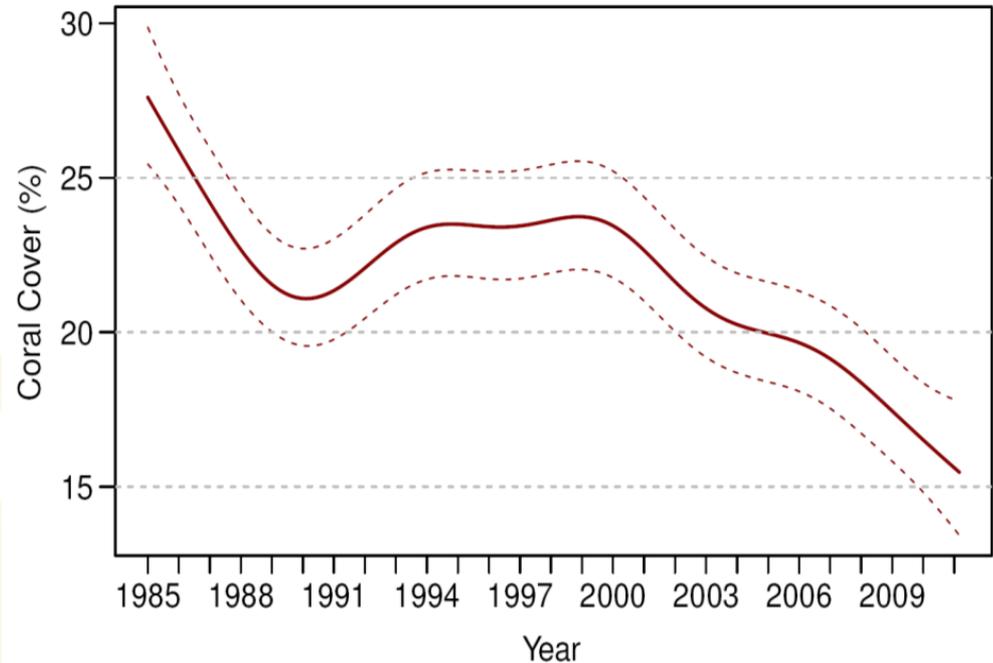
National Environmental  
Research Program

**The recent Australian  
Government response to  
outbreaks of coral-  
eating starfish on the  
Great Barrier Reef**

Peter Doherty, AIMS

TROPICAL ECOSYSTEMS *hub*

2011 - AIMS monitoring shows sustained decline in coral cover and identifies COTS as a leading cause



Marine tourism operators report new starfish outbreaks in Cairns Section

Minister Burke allocates \$1.43M for industry control program (CfOC), and

\$300K for tactical research into control (NERP Emerging Priorities)

2012 – International workshop

## **Fitzroy Island 2012 Consensus Statement on Crown-of-Thorns Starfish (COTS):**

### **“Urgent Action Required on COTS Outbreaks on the Great Barrier Reef”**

Corals are critical to the health of the Great Barrier Reef. Long-term monitoring by the Australian Institute of Marine Science shows an alarming and unsustainable decline of coral to unprecedented levels. Repeated outbreaks of crown-of-thorns starfish (COTS) together with cumulative impacts from extreme weather events and degraded water quality are responsible for most of this decline. There is an imminent threat of new outbreaks of COTS that will accelerate coral loss.

Direct and immediate action is required to address recurrent outbreaks of this native pest irrespective of causation. Current actions designed to improve water quality and to make fishing sustainable will deliver long-term benefits to the health of the GBR and must not be abandoned; however urgent additional action on COTS is needed to halt and reverse the general decline of GBR corals.

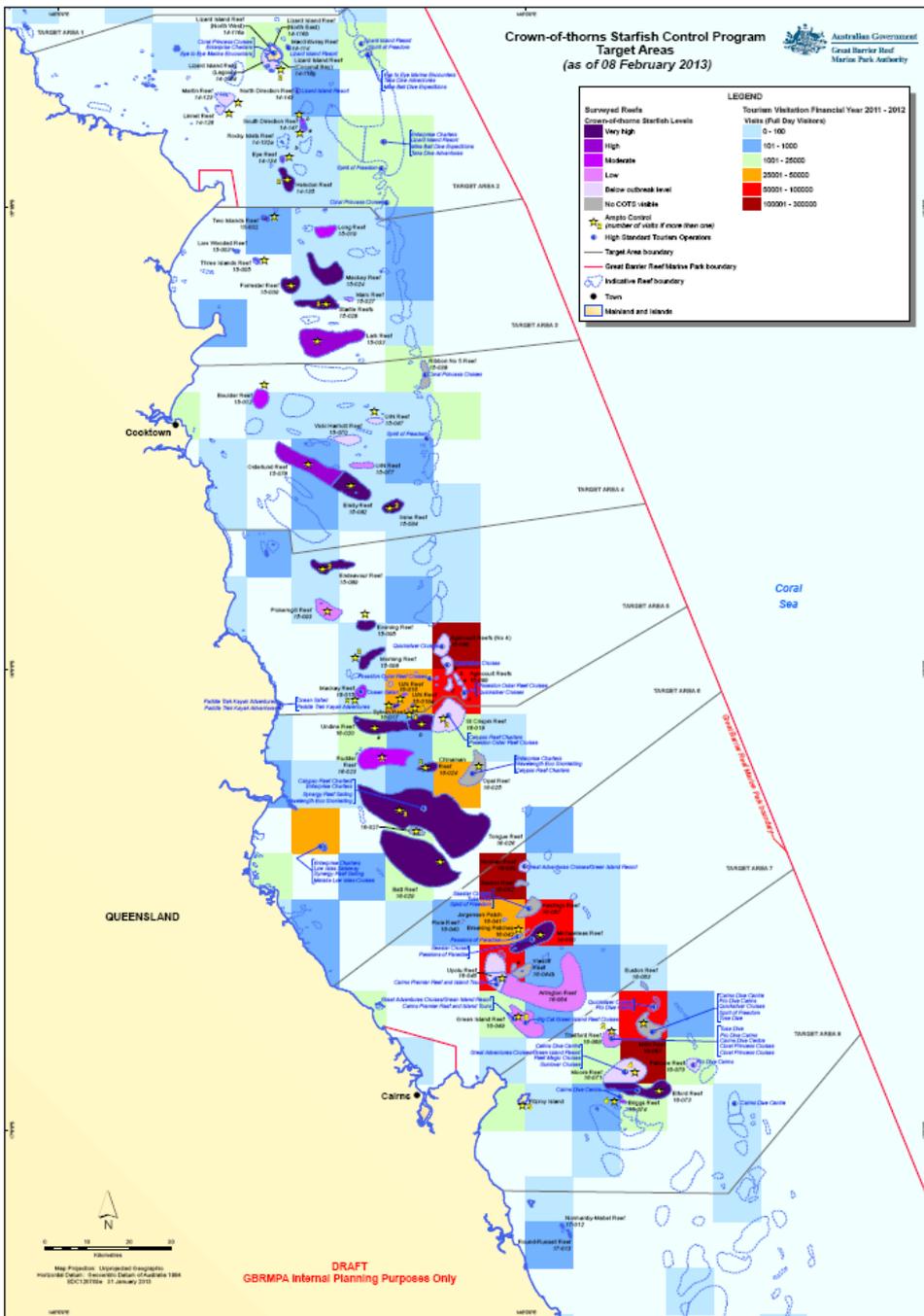
*A Consensus Statement issued at the end of a meeting on Fitzroy Island (5-6 July 2012) involving 40 participants with experience from 12 countries assembled to analyse the decline of coral cover on the GBR revealed by 27 years of large-scale monitoring.*

## Fitzroy Island 2012 Consensus Statement on Crown-of-Thorns Starfish (COTS)...

Priority actions should include:

- Surveys to detect imminent outbreaks for prioritising intervention
- Greater investment in hand control at high value locations
- Trials to increase the effectiveness of the injection method
- Trials of manual eradication at whole reef scale
- Decision support tools to optimise actions 2 and 4
- New focus in Reef Plan on priority catchments and critical nutrient sources.
- New research to find effective, safe and socially acceptable methods of population-level control based on enhancing natural pathogens, predators, or other novel approaches
- Chemical discovery of natural attractants, repellents, and spawning inducers
- Identification and filling of critical knowledge gaps to locate starfish vulnerability

The Consensus recognises that the long term health of the GBR will be driven by the rate and extent of climate change. Effective action to suppress COTS outbreaks will enhance the natural resilience of the corals to cope with an uncertain future that will include extreme weather events, rising sea temperatures, and changing ocean chemistry.



# Surveys of reefs north of Princess Charlotte Bay



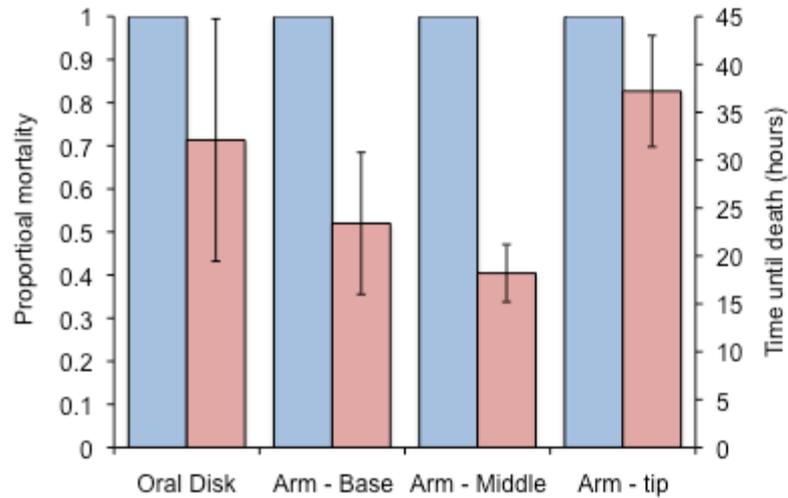
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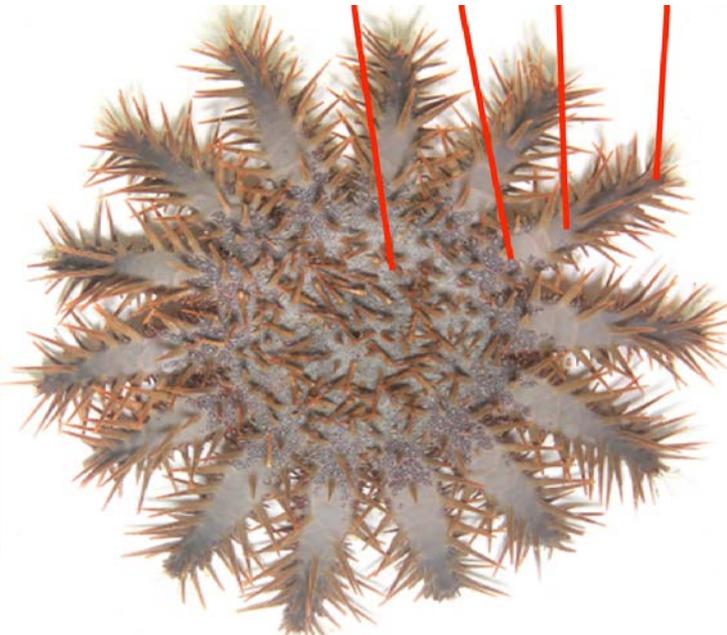
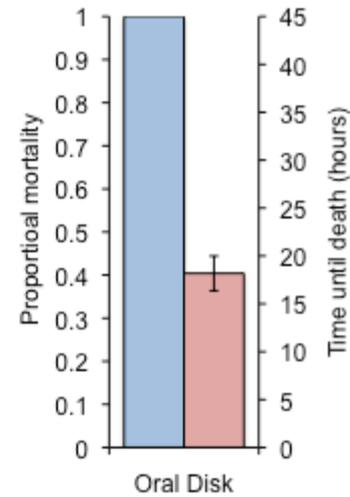
Diver-based injection is the only method currently approved for direct action against COTS

Can it be more effective?

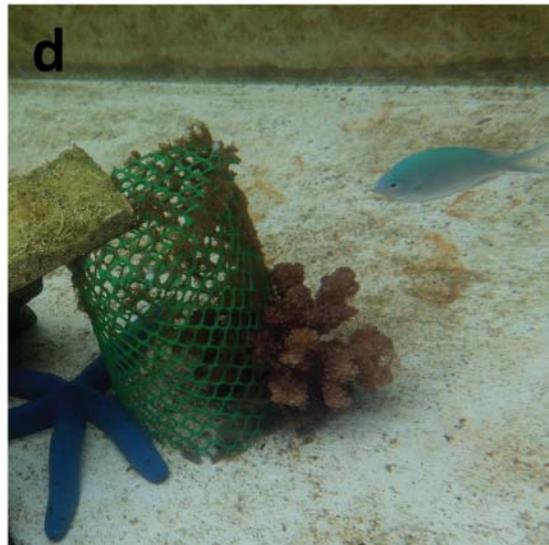
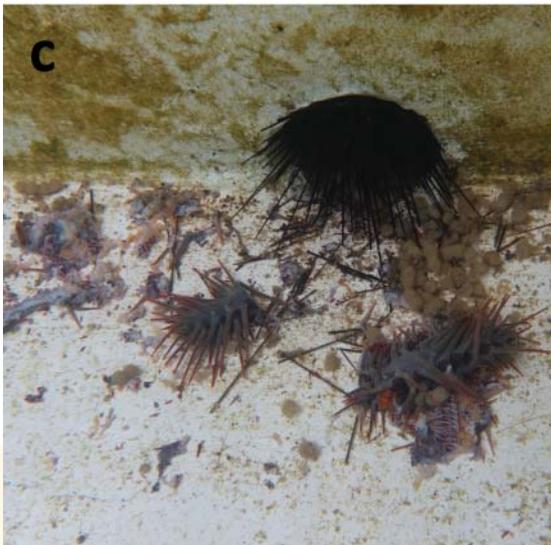
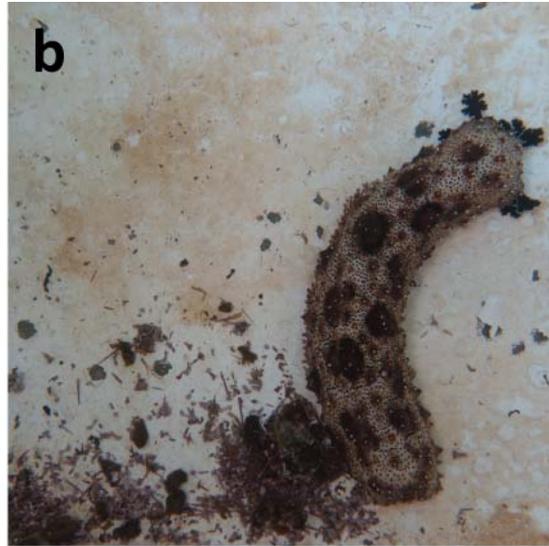
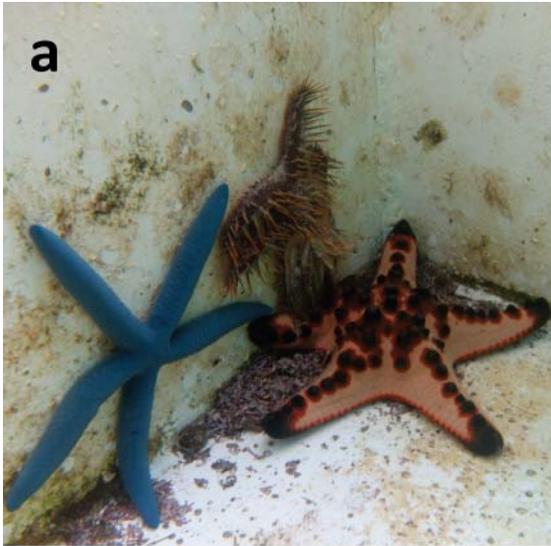
B) 4g.L<sup>-1</sup> Bile salts



C) 8g.L<sup>-1</sup> Bile salts



Rivera-Posada and Pratchett  
(unpublished)

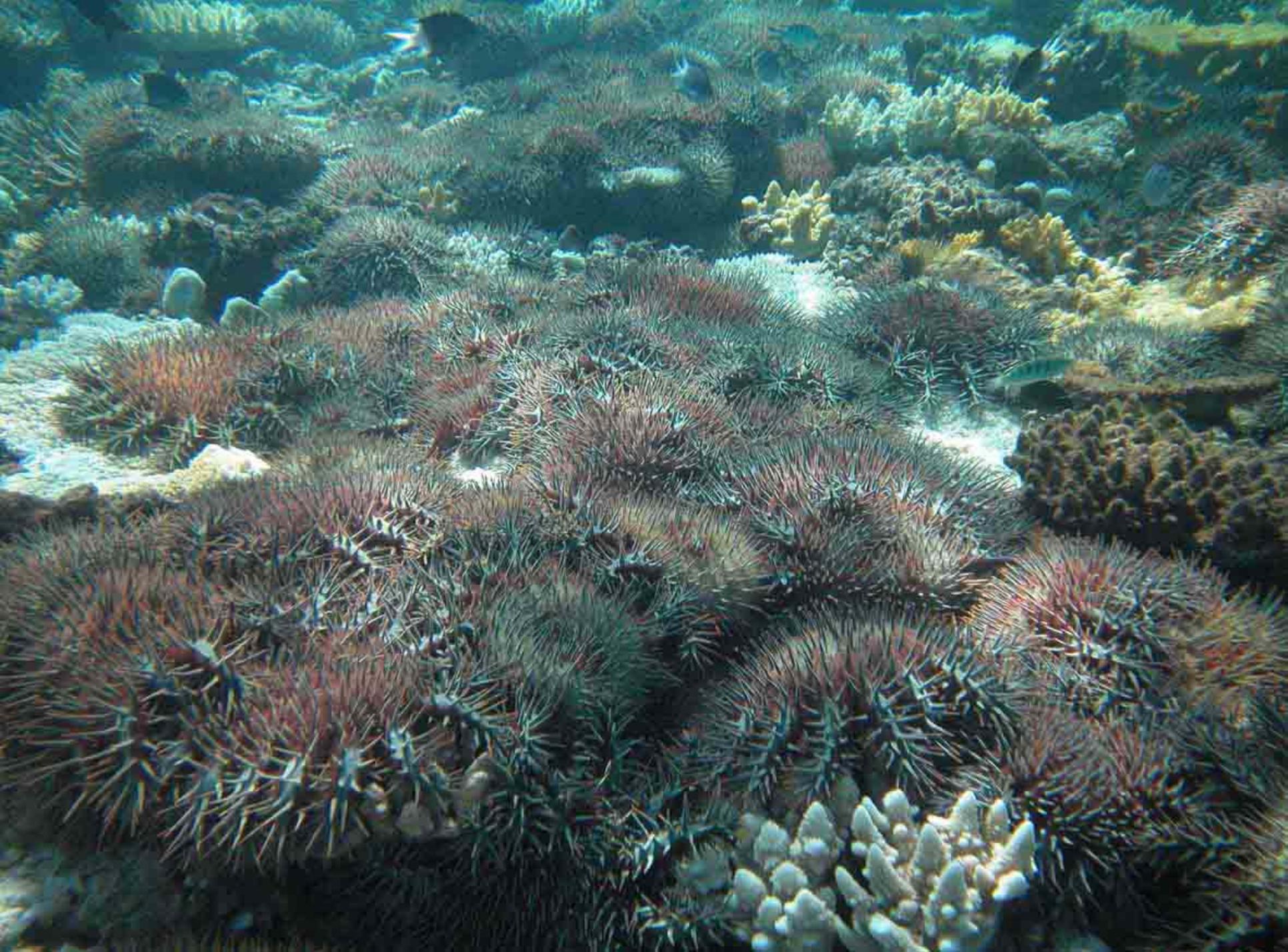




Diver-based injection with Ox-bile (instead of pool acid) reduces handling time by 4-10 times and appears safe for general use

BUT

Can it be effective for anything more than the defence of small high-value sites such as those used for mass tourism?





## Priority actions from the **Fitzroy Island 2012 Consensus Statement on Crown-of-Thorns Starfish (COTS)** that are being addressed include:

- Surveys to detect imminent outbreaks for prioritising intervention (EPF)
  - Greater investment in hand control at high value locations (CfOC)
  - Trials to increase the effectiveness of the injection method (EMF)
  - Trials of manual eradication at whole reef scale (Reef Rescue)
  - Decision support tools to optimise actions 2 and 4 (EMF)
  - New focus in Reef Plan on priority catchments and critical nutrient sources
  - *New component in Reef Rescue (2013-18) on COTS control*
- 
- Investments pending
    - New research to find effective, safe and socially acceptable methods of population-level control based on enhancing natural pathogens, predators, or other novel approaches
    - Chemical discovery of natural attractants, repellents, and spawning inducers
    - Identification and filling of critical knowledge gaps to locate starfish vulnerability