Pigeon Island reef under severe attack by Crown of thorns (COT) Starfish - call for urgent remedial action

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Pigeon Island reef- Nilaweli, Trincolmale

A large concentration of Crown of Thorn Starfish on the Pigeon Island reef. with extensive feeding scars on the Coral.

I was on a personal visit to the Pigeon Islands on the 20th May 2012 as an instructor for a group of students from the Jayawardana pura university and was visiting the reef after a lapse of about 1 year.

Within the limited scope of observations while involved in my main activity with the students; I observed that the two main reef sections on the southern shores of the Island composed primarily of extensive beds of Staghorn coral (Acropora spp.) and all allied coral habitats on the outer zone of the reef had been killed within the span of one year. The area affected amounts roughly to about 50% of the live coral area of this zone. The areas were progressively overgrown with other organisms from the deeper sections to the shallower indicating the general direction of progression of the coral mortality and degradation. The cause of the coral death was identifiable with the high prevalence of large adult Crown of Thorn Starfish (COT).

Though there was no opportunity for extensive monitoring a general swim lasting about half an hour I observed about 28 large Crown of Thorn Starfish in the section marked as (A) on the

map of the reef and further 10 in section marked (B) in a 15 minute swim. all the large starfish was found actively feeding on coral either singly or in small groups of 4-5 individuals, feeding scars were clearly evident on the reef with freshly killed dead coral skeletons still bright white in color evident around the groups of Crown of thorns starfish and areas of dead coral with progressive cover of algae and other surface reef organisms that indicate a clear progression from deeper waters to the shallows.

It is generally assumed that a population density of more than 20-30 per hectare (10,0002 m.) is considered an outbreak . The present densities observed on a very casual and brief dive is about double that density. the true extent of the infestation is expected to be much higher as greater part of the population is expected to be cryptic and hiding and not visible to a casual observation.

The role of Crown of thorn Starfish as a major coral predator is well established with the First recorded outbreakdocumented at Green Island- in the Great Barrier Reef in Australia in 1962. It is probably the most studied and highlighted marine invasive species on record and has been a major cause of coral reef degradation across the whole of the Indo- pacific marine Region.

A single Crown of Thorns starfish is estimated to consume 1 - 2.5 sq m. of coral per day and be able to move 20m. in one hour. An adult of the species (North Indian Ocean variety) can grow to over 60cm. across and reaches sexual maturity at 2-3 years of age. Crown-of-thorns starfish spend about half their time feeding. When there are few crown of- thorns starfish, they are very cryptic and tend to hide in the reef and under corals during the day. Larger starfish (more than 40 cm) usually feed during the day while smaller starfish (less than 20 cm) usually feed at night.

Post the surveys I lead in 2010 at the Pigeon Islands under the NECCDEPP study I observed a marked increase in populations of Crown of thorns Starfish compared to 2009 and indicated the need for a starfish management activity. It is very clear that the presently population has multiplied several fold over the 2010 numbers and is currently in the middle of a full blown invasion outbreak. The possibility of a further increase in populations are very likely as most of the individuals are adults and a sexual reproduction is further facilitated and gamete fertilization success rate is also increased with the higher densities of animals found in close proximity to each other.

Line of progression of the infestation the area of dead coral on the left with intact living corals on the right

Map of Large Pigeon Islands showing area surveyd and area of reef killed by the COT starfish within the present out break

The mortality of corals is significantly higher on the section A. an area which corresponds directly to the path taken by the tour boats visiting the island. it is possible there is an additional link between the pollution from the boats that could be contributing to the mortality of the reef. Blast fishing is still rampant within and close to the sanctuary with Blast damage observed on the reef and at least two reports of underwater explosions were heard by the team in day time within an estimated radius of 1-1.5 km from the Island.

Management initiative needed.

The most widespread and tested management options of controlling an Out Break of Crown of thorns Starfish is either the physical removal of the individuals or killing them with an injection of sodium bisulfate (dry acid) solution into the starfish, which kills them within a few days. This chemical is non-toxic to other marine life.

It is considered impossible to eradicate a complete population in outbreak. but an intensive reef clearing activity to eradicate most large animals from a limited area as the Pigeon Islands can be successfully achieved with a sustained support activity of regular low scale removal of new recruits over an extended period of time.

It is proposed to organize an urgent activity to conduct a series of diver COT collection activities using both day and Night dives to remove all observable individuals from the reef. The success of the activity is dependant in maintaining a longer term but non-intensive monitoring and new recruit removal activity over a longer period. This target may be easily achieved by bringing a major tourism provider as the Nilaweli beach hotel to support the activity and maintaining may be two trained divers who could visit the reef at least once a week and continue removal of all observed COT starfishes

It must be noted that special precautions need to be taken by divers collecting the starfishes as they contain hundreds of sharp crystal tipped spines and a potent neurotoxin in the skin that can cause a highly painful injury. Specially constructed tools must be employed for collection of COT and all removed animals must be promptly buried in a pit.

It is hoped that you acknowledge the urgency of the situation as the reef has suffered significant damage at present but still contain sufficient live coral areas for a speedy recovery of damaged sections of the reef. unless immediate action is initiated the reef can suffer irreparable damage within the span of 3-4 months.

An additional survey need to be carried out to establish the true extent of the infestation within the pigeon Is. reef complex.

If you need further information or support in organizing a management activity I would be eager to assist.

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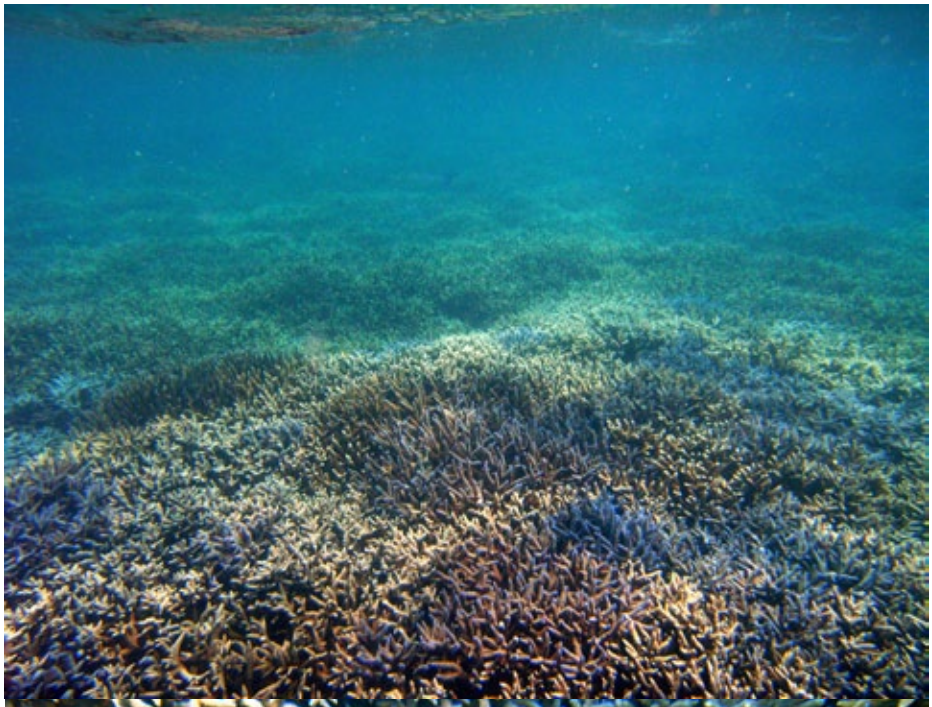
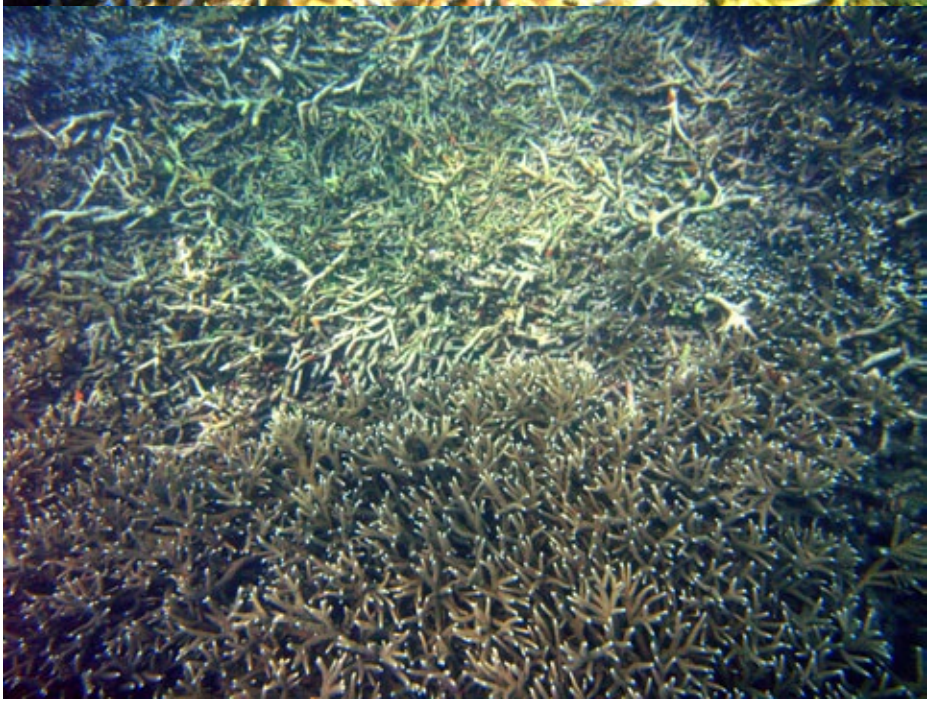
An extensive bed of Staghorn coral which has been extermitated in Sri Lanka. except in the East Coast. this was one of the best Staghorn beds surviving and threated by the current outbreak of COT



The Nothern Indian Ocean variety of the Infamous Crown of Thorns Starfish is strikingly marked.

This Large starfish contain upto two dozen arms which are coverd with sharp poisonaous spines.

Broken Coral Crater left by the explosives used by blast fishermen about 100m. from the boat entrance to the Island.



◁ *Crown of Thorn Starfish feeding in groups. with dead coral feeding scars on the reef, Showing different degrees of overgrowing by algae*

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