

Fate of small giant clams here unclear after 20 years without trace

‘Disappearance’ could reflect falling quality of habitats suitable for the species: Expert

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One of Singapore’s three remaining giant clam species has not been recorded here in over 20 years, with one expert saying its “disappearance” could reflect the declining quality of habitats suitable for this species.

The alarm bells raised by NUS marine scientist Neo Mei Lin about the fate of the small giant clam (*Tridacna maxima*) in Singapore comes amid a global review of the conservation status of all 12 species of giant clams, which are iconic organisms found in the Indo-Pacific. The global assessment of giant clams, published on Oct 28 by the International Union for Conservation of Nature (IUCN), one of the world’s largest conservation groups, had highlighted the urgency of taking action to save these animals from extinction.

Playing critical roles in the marine ecosystem, giant clams help to clean up the water column by filtering out nutrients and other larger particles. They are also a food source for fish and crabs.

For the small giant clam, it may be too soon to say if it should be considered extinct in Singapore, Dr Neo, senior research fellow at the NUS Tropical Marine Science Institute, told *The Straits Times*.

Already, two of Singapore’s five native species of giant clams – *Tridacna gigas* and *Hippopus hippopus* – have been declared extinct here.

Other than the small giant clam, the other two remaining species of giant clams in Singapore are the fluted giant clam (*Tridacna squamosa*) and boring giant clam (*Tridacna crocea*). They live among corals in the country’s southern shores and islands, including Sisters’ Islands and Pulau Hantu.

In a scientific paper published on Sept 30, Dr Neo reported that intertidal surveys conducted in Singapore between 2011 and 2020 did not uncover any traces of the small giant clam. Before this period, the

last time that the small giant clam was recorded in Singapore was in 2003, she added.

Over the 10-year period, citizen scientists – referring to volunteers with no official scientific training – patrolled about 28 intertidal reefs in Singapore’s southern waters where giant clams are mainly found, and recorded only the fluted and boring giant clams consistently.

The disappearance of *Tridacna maxima* could be due to Singapore’s reef bed not being a suitable home for them, said Dr Neo.

“This species needs a good surface to bore itself into the rubble rock, but there are a lot of loose rubble rocks in our reef bed due to years of development,” she said. “It is unsurprising that this species cannot thrive in Singapore’s unconsolidated seabed.”

UNABLE TO THRIVE

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DR NEO MEI LIN, a marine scientist at NUS, on how the “disappearance” of the small giant clam species here could be due to Singapore’s reef bed not being a suitable home for them.



The small giant clam (above) has not been recorded here since 2003, but it may be too soon to say if it should be considered extinct in Singapore, says NUS marine scientist Neo Mei Lin. Already, two of Singapore’s five native species of giant clams have been declared extinct here. PHOTO: NEO MEI LIN

Their absence could also be due to misidentification of the species, as well as the poor water quality that is not conducive for the species’ survival, she added.

Dr Neo’s finding about the small giant clam’s disappearance in Singapore comes amid the global review of the conservation status of all 12 species of giant clams – the first since 1996 – that assesses how big of an extinction threat these iconic animals face.

The latest update by the IUCN, which maintains a “Red List” that tracks the conservation status of species worldwide, found that many of these marine creatures may be more threatened with extinction than previously believed.

The species have been assessed and are categorised as either extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, least concern or data deficient.

At the global level, the IUCN found that half of the 12 giant clam species are now threatened with extinction, referring to those in the categories of being vulnerable, endangered or critically endangered.

The largest of them all, *Tridacna gigas*, is now listed as critically endangered, two notches up from its previous listing of being vulnerable.

Two other giant clam species – *Tridacna derasa* and *Tridacna mbalavuana* – are now listed as being endangered, when previously they were considered vulnerable.

For *Hippopus hippopus* and *Hippopus porcellanus*, they are now considered vulnerable, when previously they were considered to be at lower risk of extinction.

Statuses of giant clam species

In an International Union for Conservation of Nature Red List update published in October, half of the 12 species of giant clams were found to be at risk of extinction. The last time the species were assessed was in 1996.

Clams found in Singapore waters	IUCN Red List 2024 scale							Singapore Red Data Book
	Extinct	Extinct in the wild	Critically endangered	Endangered	Vulnerable	Near threatened	Least concern	
Common names (Scientific names)	IUCN Red List 1996 status		IUCN Red List 2024 status					
Fluted giant clam (<i>Tridacna squamosa</i>)	Lower risk/conservation dependent*		Least concern		Critically endangered			
Boring giant clam (<i>Tridacna crocea</i>)	Least concern		Least concern		Endangered			
Small giant clam (<i>Tridacna maxima</i>)	Lower risk/conservation dependent*		Least concern		Critically endangered			
Smooth giant clam (<i>Tridacna derasa</i>)	Vulnerable		Endangered		-			
Tevoro clam (<i>Tridacna mbalavuana</i>)	Vulnerable		Endangered		-			
Red sea giant clam (<i>Tridacna squamosina</i>)	Not assessed (rediscovered in late 2000s)		Endangered		-			
Teardrop giant clam (<i>Tridacna noae</i>)	Not assessed (rediscovered in early 2010s)		Least concern		-			
Rosewater’s giant clam (<i>Tridacna rosewateri</i>)	Vulnerable		Data deficient		-			
Elongate giant clam (<i>Tridacna elongatissima</i>)	Not assessed (rediscovered in late 2010s)		Data deficient		-			
Giant clam (<i>Tridacna gigas</i>)	Vulnerable		Critically endangered		Presumed nationally extinct			
Horse hoof clam (<i>Hippopus hippopus</i>)	Lower risk/conservation dependent*		Vulnerable		Presumed nationally extinct			
China clam (<i>Hippopus porcellanus</i>)	Lower risk/conservation dependent*		Vulnerable		-			



NOTE: *Category used in a previous version of the IUCN Red List Source: IUCN RED LIST PHOTOS: NEO MEI LIN STRAITS TIMES GRAPHICS

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Decline in giant clam populations globally

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Rounding up the six is *Tridacna squamosina*. This species was re-discovered only after the 1996 assessment, and is now considered endangered.

The other half of the 12 species are classified as least concern or data deficient.

Professor Julia Sigwart, head of malacology (the study of molluscs) at Senckenberg Research Institute and Natural History Museum Frankfurt in Germany – who contributed to the IUCN assessment – called the state of giant clam species alarming.

“It reflects a long history of exploitation that really hammered these long-lived animals,” she said. “The critically endangered species *Tridacna gigas*, in particular, should make us all reflect on how much is already lost.”

Giant clams – which can grow up to 1.2m long – are known for their intricate body patterns and their fan-shaped shells.

Globally, giant clams have suf-

fered population declines due to unchecked harvesting of their meat and shells, climate change and habitat destruction. Closer to home, some of the threats faced by giant clams in the region include coastal developments, bleaching events and even poaching, said Dr Neo.

While the IUCN’s update provides a snapshot of species populations at the global level, the conservation statuses of the same organism at the global and local levels are not always the same.

For example, the two giant clam species regularly sighted in Singapore, the fluted giant clam and boring giant clam, are both considered to be of “least concern” globally. But in Singapore, they are listed as critically endangered and endangered, respectively.

The difference is likely due to the different geographic scales, said Dr Neo. The conservation status of different species here makes use of data from local surveys, while the global assessments incorporate data from multiple sur-

veys across different areas.

Asked about the significance of having a global and a local checklist of species conservation status, Dr Neo said the IUCN Red List is the “go-to” source for stakeholders such as government agencies and conservation-related non-governmental organisations to get information on risks and threats to species.

But this alone would be insufficient to guide local conservation policies, she said.

“If Singapore agencies were to rely only on the IUCN assessments without validating the local situation, then the species would not receive the needed conservation resources,” she said.

In the case of the small giant clam, more attention should be given to this species to find out its threats and solutions to recover its population, even though it is of least concern on the IUCN Red List, she added.

While the latest IUCN assessment on giant clams would not affect the national conservation status of giant clams here, Dr Neo said it can provide information about other areas of conservation planning in Singapore, such as the allocation of funding to direct scientific research and management of endangered species.

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