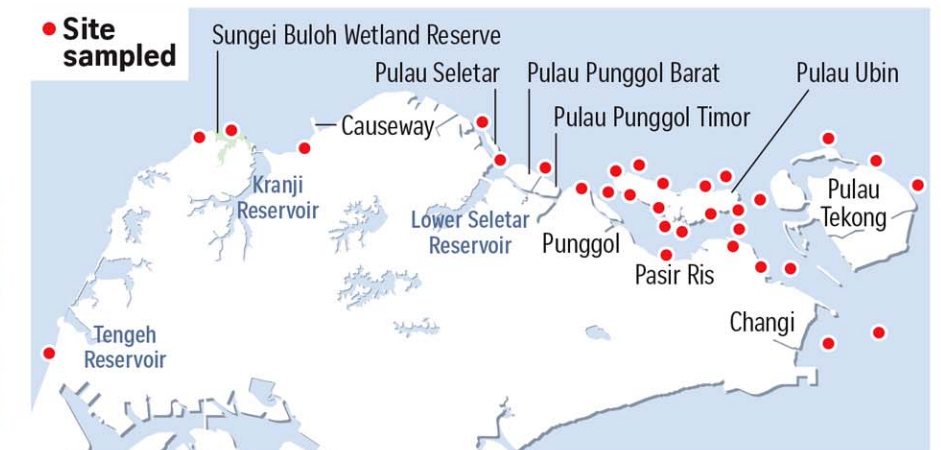




Survey of the Johor Strait

Over three weeks in late 2012, scientists and volunteers worked from Pulau Ubin to study the rich marine life in Singapore's northern shores. Preliminary results have shown at least 17 animal species new to science, including crabs and worms.



Sources: NUS, NPARKS ST GRAPHICS

Volunteers and researchers from NParks and NUS sorting the samples dredged up from the Johor Strait in 2012. PHOTO: NPARKS

New species in Singapore

Living treasure trove under the sea

17 species of invertebrates found in northern coast, and researchers expect to find more

Audrey Tan

Coral reefs hugging Singapore's southern coast are home to a great diversity of marine life, but they are not the only undersea palaces here.

New research has uncovered a liv-

ing treasure trove in lesser-known marine habitats.

Seventeen species of invertebrates (animals without backbones) new to science have been discovered in Singapore's northern shores – and researchers are expecting to find more.

"Singapore is one of the busiest ports in the world, yet we are still able to find new species, and a diversity of new species, in our waters," said Dr Lena Chan, director of the National Parks Board (NParks) National Biodiversity Centre.

"The great species diversity can be attributed to the varied ecosystems existing in Singapore, which are inter-linked, since some animals inhabit different ecosystems at their various life stages."

While identifying specimens that are new to science or new records for Singapore is encouraging, it is only the first step in understanding more about our marine habitats.

The new finds include a sea cucumber less than 2cm long, a 4cm polychaete (worm), and a 2mm gastropod (snail).

The discoveries are part of Singapore's first Comprehensive Marine Biodiversity Survey led by NParks. It roped in researchers from the National University of Singapore's (NUS) Tropical Marine Science Institute (TMSI) and the Lee Kong Chian Natural History Museum and aimed, for the first time,

to get a clear picture of sea life here.

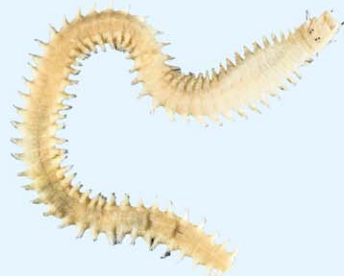
As part of the survey, NParks and NUS organised a three-week workshop on Pulau Ubin in late 2012 to study the marine life of the Johor Strait. There, the shores are characterised by mangroves, mudflats and sandy shores, largely due to sheltered conditions and the influx of sediment-laden freshwater from rivers into the Johor Strait.

MARINE HABITATS continued on B14

SOME SPECIES NEW TO SCIENCE



Protankyra scaphia
This 15mm-long creature is one of two sea cucumber species new to science that researchers discovered during the Johor Strait expedition. Dr Tan Koh Siang of the Tropical Marine Science Institute said the specimens were found in muddy, estuarine conditions – unusual for animals that generally thrive in fully marine conditions.



Neanthes wilsonchani
This multi-limbed worm, about 38mm long, was found in the intertidal mudflats during the Johor Strait expedition.



Berthelina singaporensis
The discovery of this bright green snail is all the more unique as it not only represents a species new to science but also a new record of the genus (a larger taxonomic unit) *Berthelina*. The shell lengths of the specimens collected range between 2.5mm and 6mm.

Audrey Tan

Managing marine habitats

FROM B15

Thirty-one sites were surveyed, and some 12,000 specimens were collected. These are being kept at TMSI and the Lee Kong Chian Natural History Museum and many are still being processed.

TMSI senior research fellow Tan Koh Siang said that new nematodes (roundworms) were among the more exciting finds as there has been little research on Singapore's marine meiofauna – complex multi-cellular animals generally less than 1mm in size.

"Because meiofauna have high turnover rates, they may act as good sentinels of environmental change, and we are keen to pursue this further," he said.

Unlike the more open waters of the Singapore Strait in the south, the marine environment up north is comparatively sheltered. The 50km-long Johor Strait separates Singapore from Malaysia, and is only 2km wide at its broadest. Down south, Singapore is separated from

Batam by 15km of water, and experiences significant water exchanges.

Another difference between the two marine environments is salinity. The Johor Strait receives freshwater from rivers in Johor, whereas the Singapore Strait is saltier.

"Some organisms, such as kinds of sponges, snails and fish, have flexible physiologies and there are certainly species that can be found in both the Johor and Singapore straits," he noted. "But it is clear that the composition of species, taken in total, is different in the Johor and Singapore strait."

For example, while coral reefs thrive in southern waters, they do not seem to do as well in the north due to the fluctuating salinities and heavier sedimentation there. Corals need sunlight to thrive but sediment suspended in the water column blocks the light.

The sedimentation has also led to deposits on Singapore's coast, forming the mudflats and sandflats characteristic of the northern shores.

Researchers found many differ-

ent types of polychaetes in the mudflats, and a variety of gastropods and molluscs in mangroves, said Ms Linda Goh, NParks' deputy director of the biodiversity information and policy division at the National Biodiversity Centre.

"The mudflats and mangroves are important habitats for birds, which feed on these organisms," she said.

But species recognition is only the first step in understanding more about our marine habitats, Dr Tan added. Delving into the ecology, diet, reproduction, interactions with other species, larval dispersal and settlement is the next step, he explained.

"Despite being small and constantly disturbed by coastal development, Singapore still has numerous small pockets of different marine habitats that are used by different species," he said. "It is important that we recognise and define these habitats in detail, so we can manage and conserve them properly."

audreyt@sph.com.sg

New species in Singapore

Marine worms wriggle their way into teacher's heart

Many may squirm at being knee-deep in mud and handling worms, but teacher Heng Pei Yan, 29, could not have been happier doing so.

As one of the 270 volunteers involved in a three-week workshop on Pulau Ubin to study the marine plants and animals in the Johor Strait in 2012, the passionate marine enthusiast had to process marine worms. This involved removing the tubes which the worms lived in and preserving them in chemicals so scientists could study them later.

"The removal of worm tubes was the most challenging task as some worms are very small and have small tubes," she said. "It required patience, steady hands and staring through a microscope."

Ms Heng, who has been involved in marine conservation work since 2009, also helped scientists from the National Parks Board (NParks) and the National University of Singapore (NUS) sort through specimens collected from dredging surveys.

Dr Tan Koh Siang, senior research fellow from the NUS Tropical Marine Science Institute, said the volunteers played a crucial role.

"Not only did they help to collect material from various sites by going out with the scientists, but they also helped wash and sort the specimens – a time-consuming but necessary task – so scientists could immediately see what was collected."

Before the workshop, Ms Heng was already volunteering actively with nature group Naked Hermit Crabs, leading groups on walks to the Chek Jawa wetlands.

But when she read about various animals found during earlier parts of the Comprehensive Marine Biodiversity Survey, she wanted to do more.

"What wowed me was that despite most of our coastline being reclaimed, the marine animals somehow managed to find their way back to settle."

"The diversity may not be as large as what Singapore used to have, but



Teacher Heng Pei Yan, 29, sorting through samples collected during an expedition to survey Singapore's shores. PHOTO: COURTESY OF IVAN KWAN

it is the resilience of the animals, their reappearance and their choice of location that make me curious to know more about them," said Ms Heng.

"I felt that this was a great opportunity for someone like me, without a biology background, to experience fieldwork and learn more about our marine life."

Dr Lena Chan, director of NParks National Biodiversity Centre, said such citizen science efforts could help raise awareness about Singapore's marine life.

"If people don't know the ecosystems and the species within them, they wouldn't know why they need to be conserved," she said.

Audrey Tan

WOW FACTOR

What wowed me was that despite most of our coastline being reclaimed, the marine animals somehow managed to find their way back to settle.



MS HENG PEI YAN, a teacher and volunteer who has been involved in marine conservation work since 2009