

Boosting wild species populations via captive breeding programmes

S'pore conservationists take part in projects involving rare birds, crabs, clams and corals

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When Singapore's first giant panda cub was born at the River Safari earlier this month, the country welcomed its arrival with much excitement.

Conservationists have reason to cheer too – as offspring from breeding programmes such as the ones for giant pandas can help to boost the numbers of wild species threatened with extinction.

Wildlife Reserves Singapore (WRS), which manages the four wildlife parks here, is involved in

150 ex-situ managed breeding programmes. Ex-situ programmes involve nurturing a species outside its natural habitat, in a controlled setting.

Dr Cheng Wen-Haur, WRS' deputy chief executive and chief life sciences officer, said: "Depending on the species, some of these individuals born under human care may find themselves returned to the wild as part of species recovery plans. These recovery plans are usually the results of a partnership between zoos, non-governmental organisations and governments."

One example is the Santa Cruz

ground dove from the Solomon Islands. In 2017, WRS sent staff there to care for birds rescued by a local non-governmental organisation.

Dr Cheng said the team brought back half of the world's surviving population and the numbers have now nearly doubled under WRS' care.

He added: "Plans to send some birds back to their country of origin are pending the evolving situation with the global pandemic."

Even within Singapore, captive breeding programmes have helped increase the number of native species found in Singapore's forests and shorelines.

A captive breeding programme for the Singapore freshwater crab (*Johora singaporensis*) – an animal that is found only in the Republic

and nowhere else in the world – was undertaken by the National Parks Board (NParks), National University of Singapore (NUS), WRS and international biodiversity experts as part of a species recovery plan.

Since the first successful brooding of crab eggs to maturity in 2018, more than 100 of the crabs have so far been released into the wild and more will be released soon.

Singapore freshwater crabs were previously found only in a few hill streams in Bukit Timah, Bukit Batok and Bukit Gombak. But the experts have now successfully moved the crabs and established a new population at a freshwater hill stream in Bukit Batok where they were previously not found.

"Captive-born individuals have been released to another selected stream and monitoring of the new population is ongoing," NParks added.

Marine biologists in Singapore have also reared coral fragments and giant clams in nurseries to help replenish degraded reefs here.

Dr Neo Mei Lin, a giant clam researcher at the NUS Tropical Marine Science Institute, was involved in a giant clam mariculture and restocking programme, which received funding support from NParks between 2011 and 2018.

She said: "We were able to produce at least five cohorts of cultured fluted giant clams (*Tridacna squamosa*), which are native to Singapore, and eventually about 250 hand-reared individuals were transplanted to various reefs

among the Southern Islands in 2016."

But researchers cautioned that breeding programmes must be well planned for them to reach the desired outcome.

For example, inter-mixing of introduced and wild individuals could dilute the original genetic diversity in populations in the long term, Dr Neo said.

Dr Lionel Ng, a coral scientist at NUS who has been involved in research projects to nurture coral fragments in nurseries and transplant them onto reefs here, said simply moving species to their original environments is insufficient as a fix.

"As corals grow slowly, successful conservation programmes require long-term commitment from various stakeholders, from ensuring that environmental stressors are removed or reduced to monitoring how the transplants fare over time, and mitigating problems as they arise."

Dr Neo said: "Ultimately, each conservation manager for respective sites needs to weigh the pros and cons of permitting the release of captive-bred individuals with respect to achieving their goals for conservation."

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