Helping frogs to breed better in the wild

They take to artificial habitats set up by NUS student in her project

BY VICTORIA VAUGHAN

FROGS are happy to have a helping hand when it comes to mating, a National University of Singapore (NUS) student has found.

Miss Tee Yu Tian, 23, found that the average number of mating calls from the frogs rose from nine to 13 a night after she provided artificial breeding sites in rain-filled cups, basin and dishes.

Her study centred on the black-spotted sticky frog, so named because of a glaucic-like mucous it secretes from its skin when threatened.

The frog is highly dependent on rain-fall as it lays its eggs in puddles collected in leaves or water collected in declining pitcher plants.

In October last year, Miss Tee began to measure the numbers in her study area along the 400m catchment path in Bukit Timah Nature Reserve.

She went into the reserve three to four times a week for about two hours each time.

These ground-dwelling frogs can grow up to 3cm for males and 5cm for females and are brown in colour, making them tricky to spot against fallen leaves.

The student carried out audio surveys at night as these frogs make a big noise. The mating call of the male sounds like a high-pitched, short, repetitive whistle.

At the start of December, Miss Tee took two days to set up various artificial habitats in plastic and bamboo cups and plastic and ceramic basins to see if it encouraged breeding.

The cups were filled naturally with rainwater and it took less than two weeks for the frogs to make use of them, with batches of 10 to 30 eggs laid.

It took 14 to 16 days for the frogs to develop from the egg.

Proglottids that developed in the plastic basin were found to have the best survival rate of 63 per cent.

However, introducing these cups had a wider effect on the ecosystem as dragonfly larvae, which eat the tadpoles, were also found in the basins.

Another unforeseen consequence was that thirsty macaques drank the water from the sites and destroyed the basins.

Also, a sudden and marked increase in the number of these frogs may attract the food chain; they feed on ants and termites and are eaten by snakes.

Miss Tee said: "I think we should continue to help vulnerable species, but we have to have a more complete study of the surrounding effects."

"This is possible but it will require more money and it would be good to try and get the Government involved as they are the ones with the money to put into it."

The study cost about $500 and Miss Tee is in the process of trying to get it published in a journal.

Assistant Professor David Rickford from the NUS Department of Biological Sciences, who followed on from Miss Tee's study, needs to be a strategy for all the rare and endangered frogs in Singapore.

"These frogs need specific kinds of phytoelmata (water-holding plants or tree holes) or pristine streams. Those will be what we try and provide for them -- in quantities and qualities that have deteriorated in Singapore in the past decades," said the frog expert, who supervised Miss Tee's project.

Dr Leong Tzi Ming, a National Parks Board research officer in charge of a survey to document nature in Bukit Timah and the Central Catchment nature reserves, said the findings had important implications for future conservation efforts.

"It shows that this particular species is receptive to artificial micro habitats which could help in the conservation of species that may be affected by prolonged dry weather," he said.

There are 25 frog and toad species in Singapore and the survey found that while numbers do not seem to be declining, the locations of populations have shifted as these amphibians move to be closer to reliable water sources.

"This is good news for the island's biodiversity," said Dr Leong, as frogs are seen as an indicator of the health of biodiversity. This is because they are most rapidly affected by changes in the environment from pollutants or a lack of water as they have thin skin. If the frogs are doing well, it is likely that the ecosystem is in good shape.

One of the key findings of the survey was that the black-spotted sticky frog got busy breeding when artificial habitats, such as plastic and bamboo cups and plastic and ceramic basins, were set up in its natural environment. The finding has important implications for the conservation of vulnerable species. PHOTO: TEE YEA TAN

American Bullfrogs don't belong here

UNWELCOME visitors were found by the National Parks Board (NParks) survey on the Central Catchment and Bukit Timah nature reserves which could pose a threat to native wildlife.

Several American Bullfrogs, native to areas of North America, were found in the nature reserves.

"Most of the bullfrogs were quite young, so it seems that they are not breeding well here, probably because they are not used to a tropical climate."

"But it is quite alarming as they can hang on for a couple of days and they have been known to carry the chytrid fungus, which has been identified as a serious threat to amphibians around the world," said survey leader Leong Tzi Ming.

It is thought that these frogs, which can grow up to 20cm, have been released by pet owners and animal lovers who wish to spare them from being eaten as this species is traditionally used for local cuisine.

Dr Leong urged people not to release these frogs into the wild as they could harm local species.

The Agri-Food and Veterinary Authority (AVA) discourages the release of non-native animals because of the potential negative impact it can have on the animal and on the environment.

Under the Animals and Birds Act, any owner who abandons an animal is deemed to have committed an act of cruelty which carries a fine of up to $10,000 and/or 12 months' jail.

Greens, non-native species have caused havoc as they establish themselves in a new area and become invasive, harming local wildlife.

Perhaps the most famous example is the Cane Toad in Australia.

According to the Australian Museum, Sydney, 100 toads were brought into the country from Hawaii to set local larvae which was destroying sugar cane crops.

In July 1935, after some swift breeding, more than 3,000 were released.

With few natural predators, it has grown in numbers and threatens local amphibians and bees which it eats, while snakes and pets are poisoned by glands on the toad when they try to eat it.

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