

Mist blowing through cloud forest at Mt Lewis, Queensland. Such forests strip significant quantities of moisture from mist and fog.

One fish, two fish

AUSTRALIA hosts no more than a handful of freshwater sharks, sawfish and rays, several of which are thought to be endangered. Among them is the spear-tooth shark (*Glyphis* spp).

In the past 20 years, some 20 spear-tooth sharks have been recorded in the rivers of Queensland and the Northern Territory. But there have been no systematic surveys of their numbers and little study of their life cycle.

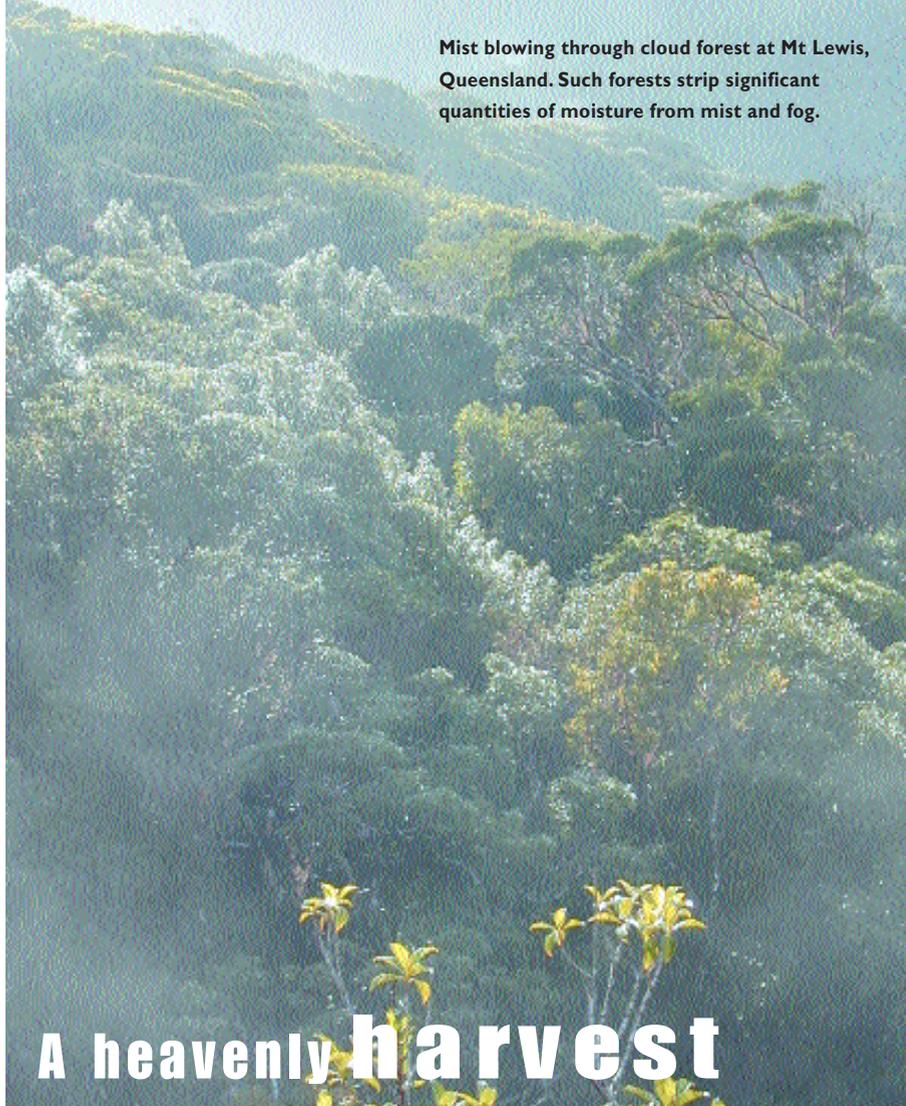
Dr John Stevens and Dr Peter Last of CSIRO Marine Research hope to learn more about the distribution and ecology of these species

The survey and population assessment, funded through Environment Australia's Natural Heritage Trust, will involve CSIRO, the Museum and Art Gallery of the Northern Territory, the Northern Territory Fisheries Division, the University of Western Australia, the Queensland Department of Primary Industries, Murdoch University and the Queensland National Parks and Wildlife Service.

Stevens says a better understanding of the ecology of these freshwater animals and their numbers will underpin future conservation decisions.



Peter Richardson of CSIRO Land and Water attaches a collar gauge to a tree trunk to measure stemflow.



A heavenly harvest

A team of scientists from CSIRO and James Cook University has discovered that upland rainforests in north Queensland have a remarkable ability to harvest water from the skies.

Not content with waiting for rain, these forests act as an aerial sponge, directly intercepting cloud moisture in a process known as cloud-stripping.

In highland regions more than 900 metres above sea level, low cloud, mist and fog drift continually through resident rainforests and condense on the trees, causing moisture to run or drip down to the ground. In this way, the cloud forest harvests large volumes of water in addition to that falling as rain.

The research team, led by Dr Paul Reddell and Dr David McJannet of the Cooperative Research Centre for Tropical Rainforest Ecology and Management, used a range of measuring devices to investigate the phenomenon.

Collar gauges were fitted around trees to measure stemflow, throughfall troughs were placed under trees to measure water dripping through the canopy, and

conventional rain gauges were put in clearings. The rain gauge readings minus throughfall plus stemflow gave the amount of water stripped from clouds by the forest.

'From our early work, it looks as if rainforests, on average, contribute 10–25% more water to the catchment above that falling as rain,' Reddell says. 'That equates to billions of litres of extra flow into tropical river systems.'

Clearing rainforests cuts back the quantity of moisture reaching the soil because the contribution via cloud stripping is lost. Conversely, replanting trees should boost water inputs.

The researchers point out that global warming is forecasted to push cloud banks higher up the mountains, with a 1–2°C temperature rise likely to raise the height of the cloud layer by 100–200 m. This would reduce the area of tropical-mountain cloud forest in north Queensland by more than 75%.

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