Feature

Bye Baiji?

Florian Maderspacher looks at the decline of the Baiji, the Yangtze river dolphin, now considered 'functionally extinct' following a recent expedition's failure to find any trace of these charismatic animals.

Once upon a time on the banks of the river Yangtze, a beautiful young girl is said to have lived with her stepfather. He was an evil, greedy man and one day he took her on a boat, intending to sell her on the market. Out on the river, he became infatuated with her beauty and tried to take advantage of her. But she freed herself by plunging into the river, whereupon a big storm came and sank the boat. After the storm had settled, people saw a beautiful dolphin swimming — the incarnation of the girl — which became known the 'Goddess of the Yangtze'.

Now, the fabled creature, the Baiji or Yangtze river dolphin (*Lipotes vexillifer*), may have disappeared forever. A recent, six-week expedition scanning all known habitats of the Baiji has published the results of its unavailing search: no sight of the charismatic animal was caught and thus the Baiji can be regarded as 'functionally extinct'. This would mark the loss of the single representative of an entire family of mammals, the Lipotidae, and the first extinction of a large mammal since the disappearance of the Caribbean monk seal in 1952. The Baiji would be the first species of whale to become extinct through human impact, even though — unlike many other whales — it was not actively hunted.

The bookkeepers of extinction still argue to what extent it is safe to conclude from the results of the survey that the species is really extinct. In fact, only three weeks after the survey's results were published, a live Baiji was allegedly filmed in the Yangtze. Experts, however, were hesitant to confirm this was indeed a Baiji. Chances are that, as in earlier cases, the finless porpoise, which also inhabits the Yangtze, was mistaken for a Baiji. Obviously, proving the existence of an animal is much less equivocal than proving its non-existence — this holds for dolphins as much as for unicorns. But in any event, it is unlikely that the odd Baiji that may or may not have escaped the sensitive detection equipment of the expedition will suffice to ensure survival of the species.

Obituaries normally give an account of the life and times of the deceased, but deplorably little is known about the life of the Baiji. Despite having been familiar to local fishermen and described by Chinese scholars almost a thousand years ago, the Baiji entered the records of Western science only some 90 years ago: a young American had followed the good standard practice of shooting first and asking questions later and realised that he had discovered an entirely new species of dolphin. Erroneously, the Chinese name 'Baiji' was translated as 'white flag' and thus this species became known initially as the 'White Flag Dolphin'. Its remarkably similar ancestors seem to have entered the Yangtze system some 20 million years ago, where they hunted for fish. The Baiji had very poor eyesight — an adaptation to the poor visibility in sediment-laden rivers — and relied mainly on their echolocation system for navigation and hunting.

This adaptation may have turned against them as boats began to turn the acoustic environment of the Yangtze into a cacophony of motor noise. The recent survey, while not seeing any Baijis, counted about 20,000 large ships, one vessel per every 100 m of river surveyed. For the sonar-dependent Baiji, it must have been "like a blind man trying to live in a discotheque. Or several competing discotheques", as Douglas Adams put it in his now historic account in 'Last Chance to See'. In addition to the ensuing accidents, pollution, increased sediment load and habitat destruction may have taken their toll — after all, one in eight humans live in the catchment area of the Yangtze. Perhaps the single most prevalent risk to the Baiji, as suggested by the authors of the study, was by-catch during commercial fishing. Indeed, more than half of the recorded Baiji

Last chance to see: A recent survey failed to find any evidence of the Baiji river dolphins in the Yangtze. (Photo: Stephen Leatherwood/PA Wire.)

fatalities in the 1970s and 80s were due to fishing equipment.

It is not that these threats went unrecognised. Aside from a brief spell during Mao's Great Leap Forward — when Nature was declared an 'enemy of the people' and the Baiji was actively prosecuted — the urgent need for its conservation was gradually realised inside and outside of China. But, while some attempts were made to establish a captive population, the Baiji's demise could not be halted in the face of the exorbitant economic growth: the last Baiji sighting was in 2002 and in the same year the last captive animal died.

The Baiji was one of five species of river dolphin: the Boto, or Amazon river dolphin, the Fanciscana, living on the La Plata estuaries in Argentina, as well as the closely related Susu and the Bhulan of the Ganges and Indus rivers, respectively. They all show a number of convergent evolutionary adaptations, most notably their poor eyesight, verging on complete blindness in some of them. As similar as their biology are the threats they face from habitat destruction, increased water use and fishery.

In particular, the Ganges and Indus rivers dolphins are in immediate danger. Like the Baiji, they are 'living fossils' and the only representatives of a once successful mammalian family. Their estimated numbers each range between 1,000 and 2,000 individuals and are predicted to be dwindling, as they share their habitats with a dense and ever-increasing human population for which water is as vital as it is for them.

Whether the Baiji is now being classified as 'possibly' or 'functionally' extinct, whether or not there will be future headlines of the odd Baiji sighting, it has by now almost entered a realm of the unreal, of the mythical — not much different from that of the pretty girl whose incarnation it was fabled to be. Ironically, knowing next to nothing about how the Baiji lived, we are not far away from the ignorance of the fishermen who created the myth, except that they treated the 'Goddess of the Yangtze' with respect.

Hidden gems

Amidst all the fears of loss of biodiversity around the world, and particularly in the tropics where so much exists and is least charted, Costa Rica stands out as a small but highly significant home for a vast diversity of species, whose futures are being taken seriously.

Many researchers within the country and from outside are involved in projects cataloguing, monitoring and researching the rich array of species that occur in Costa Rica's diverse tropical habitats.

And a new book* celebrates a small selection of the enormous diversity of moths and butterflies in the country in large-format photographs taken by Jeffrey Miller, from the Department of Rangeland Ecology and Management at Oregon State University.

The photographs are accompanied by species accounts and caterpillar images. Together with co-authors Daniel Janzen and Winifred Hallwachs at the University of Pennsylvania, they describe the insects' abilities in mimicry and migration, courtship behaviours and describe how DNA technology is boosting lepidopteran biodiversity research.

The authors carried out their work in the Guanacaste Conservation area in north-west Costa Rica, a remarkable reserve that is only the size of New York City and its suburbs. But within this region, 10,000 species of moths and butterfly species have been estimated to exist, representing wide taxonomic diversity, and variations in behaviour and life-history tactics.

An inventory has also been compiled of the caterpillar stages of moths and butterflies in this region.

"We chose to show these moths and butterflies through one of the many possible lenses, as artistic portraits pinned against a black background, partnered with species accounts that illuminate the life histories trusting that a beautiful creature is made more beautiful if it is understood", the authors say.

The long-term work of Jansen and Hallwachs, a team of caterpillar collectors, and the participation of neighbouring farming communities has deepened understanding of Costa Rica's lepidoptera and has brought about advances in restoration ecology of tropical habitats, biodiversity prospecting, biotechnology and ecotourism development, the authors write.

Colour coded: One of the dazzling species of lepidotera (*Zerene cesonia*) depicted in the book.