



Stranger than fiction

A mammal that lays eggs and secretes venom, the peculiar platypus has been fascinating scientists since the 19th century but faces an uncertain future.

A furry animal with a body the size of a hot-water bottle is cavorting through the waters of a clear, blue stream emerging from Jenolan caves, three hours west of Sydney. There is a splash as it dives down, paddling vigorously with its webbed front feet. When it reaches the bottom, the animal begins sweeping its flat, duck-like bill back and forth above the silt. The platypus is using thousands of minute receptors in its bill to detect the electrical fields made by the muscle

movements of its prey – mainly insect larvae, aquatic insects, and sometimes freshwater crayfish and shrimp.

It is relatively easy to spot a platypus in the limpid stream and Blue Lake at Jenolan, but normally they are far harder to detect. Their waterproof brown coats offer good camouflage against the earthy banks of the permanent rivers, creeks, lakes and wetlands they inhabit in eastern Australia.

They're also largely nocturnal, and usually spend the day sleeping in their burrows, which may be up to 30m long, in the river banks. They emerge at dusk to hunt for their ▶

By *Linda Vergnani*
Photographs *Doug Gimesy*

The semiaquatic platypus has webbed feet and a duck-like bill. When the first dried specimens were brought to Europe, scientists believed they were a hoax.



aquatic prey and retreat at dawn. Females weigh 600–1,750g, while males are a heftier 800–3,000g (platypuses in north Queensland are about half the weight of those in Tasmania).

This curious creature is a monotreme: a form of egg-laying mammal that suckles its young. It has a single orifice – the cloaca – used for urination, defecation and reproduction. The only other monotremes are four species of echidna, but these are very different looking, spiny land dwellers.

Tom Grant, author of the natural history guide *Platypus*, spent over 40 years researching platypuses on a 5km stretch of the Shoalhaven River in New South Wales. He microchipped 812 individuals and found the oldest female platypus in his study was still breeding after 21 years.

Would you believe it?

When dried specimens of this species were first sent to Europe at the end of the 19th century, some naturalists thought the animal was a fake, assembled by a wily taxidermist. Not only did it have a duck-form bill and a beaver tail, but the animal laid eggs like a snake or bird.

Tom says the bill is actually nothing like a duck's bill. "It feels like kid leather and is very soft, pliable." Up close, the thousands of electro and touch receptors that give the animal a 'sixth sense', look like tiny pores covering the surface of the bill.

In his book, Tom describes how, after mating, the female platypus lays up to three eggs in a nest of wet vegetation that she makes in a chamber in one of her burrows.



The females are thought to incubate the eggs by curling their bodies around them.

When the young hatch after about 10 days, the mother feeds them from two milk patches (areolae) on her chest. The nestlings lick the milk off their mother's fur, as the platypus has no teats.

Tom says though the platypus is an iconic animal, scientists still don't know much about its ecology. Professor Richard Kingsford, Director of the Centre for Ecosystem Science at the University of New South Wales, says, "They're very difficult to work on because they keep ungodly hours and they're very cryptic."

It is hard to get quantitative data on the platypus. At the turn of the 19th century, "tens of thousands of these creatures were killed for their fur," says Richard, and the species never really recovered. It wasn't until 1912 that the species was officially protected in all states.

Richard led a national risk assessment study into platypuses, which showed a "worrying" 30 per cent decline in platypus numbers – from an estimated 300,000 when European settlers colonised Australia 200 years ago to 200,000 or fewer now. The researchers based the projections on historic reports of platypuses as well as current research across 300km of river in four states. Richard says, "We have great concerns about the future survival of this unique species". The platypus is listed as Near Threatened on the IUCN Red List.

The study is part of the Platypus Conservation Initiative (PCI), which aims to reduce the risk of the species becoming extinct, and better conserve the wild populations. It includes researchers from three universities and Sydney's Taronga Zoo as well as a private consultancy Cesar.



Once highly sought after by the fur trade, the thick, waterproof fur of the platypus helps to insulate this species in the water.

Aquatic courtship rituals

Female platypuses are in charge of breeding encounters, according to Dr Jessica Thomas, senior keeper at Healesville Sanctuary. Observing captive platypuses courting and mating as part of her doctoral research, Jessica said the female took evasive action to avoid the male until she was ready to breed. "The males have got very high testosterone levels during the breeding season, which also makes them very aggressive." In the wild, they sometimes try to dig their venomous spurs into rival males.

As the female came into season, she began playing around in the same pond as the male. "Then the next stage is the male bites the

female on the tail and she bites him on the tail", says Jessica. The couple then began an elaborate courtship dance, doing barrel rolls, twists and turns.

They continued courtship for much of the day for up to two weeks. After a brief mating, over one or two nights, the pair went their separate ways. The female dug her own nesting burrow in which she laid her eggs.

Jessica used an infra-red camera to observe the nestlings' behaviour and development in the burrow. The mother fed the babies for about 128 days, Jessica reveals. Her

research will now be used to improve knowledge of how to breed and manage platypuses in captivity.



The animals are difficult to track in the wild. Researchers cannot attach radio collars to platypuses for fear they might strangle or drown as they forage between submerged roots and branches, according to Richard. For the past three years, his team has fitted some platypuses with acoustic tags and tracked their movements with listening stations along certain riverbanks.

Handle with care

Scientists capturing platypuses in the wild take great care to avoid the venom spurs on the hind ankles of the males. Used in fights against rivals, the complex venom injected through the spurs causes agony in humans.

Gilad Bino, research fellow at the Centre for Ecosystem Science, remembers the adrenaline rush when he and a veterinarian from Taronga Zoo untangled their first wild platypus. It was caught in a fyke net (an unweighted mesh net, which allows the platypus to surface) they had set up on the Severn River. The scientist was researching the impact of dams and river regulation on the health of platypuses for the PCI. ▶

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Clockwise from top left: a platypus research project in the Snowy River; measurements are taken to compare populations; fyke nets are checked every four hours.