Platypus News & Views

Newsletter of the Australian Platypus Conservancy (Issue 99 – May 2025)

DROUGHT AND THE PLATYPUS

The platypus is adapted to feed only in the water, using bill receptors that must be wetted before they can detect prey items (such as worms and insect larvae) effectively.

Low water levels can also contribute to the risk that a platypus is killed by a predator, particularly if some parts of the channel dry out so animals need to walk across land to access neighbouring pools.

Nonetheless, relatively few platypus mortalities have to date been linked unequivocally to drought (see *PN&V* no. 98). In part, this likely reflects the fact that such deaths may be difficult to assign (for example, if a weakened animal dies in a burrow, or a carcass lying in a dry river bed is consumed by scavengers). However, it is also true that the platypus has had millions of years to develop adaptations contributing to its ability to survive droughts.

A recently published study in *Marine and Freshwater Research* – co-authored by Simon Roberts (Upper Huon Wildlife Monitoring Landcare Group) and Melody Serena (APC) – provides some fascinating new insights into how platypus behavioural patterns change to improve this animal's prospects for survival as water levels drop.

The study was conducted along Kellaways Creek, a tributary of the Huon River in southeastern Tasmania which usually flows very reliably throughout the year. However, rainfall in the Kellaways Creek catchment was well below normal in 2023, with dry conditions intensifying from January to March 2024. In response, the creek stopped flowing for just over 7 weeks, from 11 February to 2 April 2024.

Photo: S. Roberts

Following on from camera studies previously conducted along Kellaways Creek during a period of normal flow in 2021 and 2022, time-lapse cameras were used in 2024 to track platypus activity both during the day and at night (as shown at right). The study mainly focused on platypus behaviour from January to June, with less intensive monitoring from July to December. The frequency and duration of platypus activity were monitored in a study area comprising 235 metres of creek channel, including two sizable pools linked by 175 metres of much shallower habitats (riffle or run).

To help interpret changes in platypus behaviour, daily variation in creek depth and maximum air temperature was described.

In addition, a camera drone was used to record aerial images of the study area on two occasions: at the end of the cease-to-flow period and again when normal flow had resumed. This enabled the impact of drought on the extent of surface water in pools and shallower channel habitats to be measured accurately.

(cont. on page 2)

DROUGHT AND THE PLATYPUS *(cont. from p. 1)*

The drone-based aerial studies confirmed that mean (or average) pool width declined during the cease-to-flow period to around 75% of its normal value. In addition, more than 70% of intervening shallower habitats along the length of the study area became dry.

As an outcome of these changes, the total area of wetted channel potentially containing food for a hungry platypus was reduced to just 40% of its normal extent by the end of the cease-to-flow period.

How was platypus behaviour affected by these events?

First, the timing of platypus activity changed so animals foraged increasingly at night and less during the day as water levels dropped. In practice, more than 90% of activity events occurring at pools during the cease-to-flow period were recorded at night. In contrast, diurnal activity events outnumbered nocturnal events by a factor of more than two when flow was high.

One possible explanation for animals becoming more nocturnal as flow declined – namely that they avoided diurnal activity unless plenty of surface water was reliably available in which to stay cool – could be ruled out given that the temperature threshold when the platypus is known to reduce activity to limit metabolic heat gain (29^{o} C.) was exceeded on only four days in the study period. Furthermore, the Kellaways Creek channel is generally well shaded by native trees and shrubs.

Alternatively, it makes sense that platypus may have been motivated to become increasingly nocturnal as the channel dried out to reduce the likelihood they were detected by potential predators. Along Kellaways Creek, these include Tasmanian devils, spotted-tail quolls and eagles, along with occasional wandering dogs.

The spatial distribution of platypus activity also varied with changing water depth, with foraging becoming increasingly concentrated in pools as surface water disappeared. On average, the mean length of time that a platypus spent foraging in a pool was seven times longer on days when flow had ceased as compared to when flow was high. The opposite was true for shallow riffles, where maximum event duration was five times longer on days of high flow as compared to the cease-to-flow period.

This finding – which makes perfect sense given that a platypus can only feed in the water – highlights the crucial role played by reasonably large pools in providing platypus foraging habitat during unusually dry periods.

The fact that platypus activity patterns can be affected by changing water level also has important implications for platypus monitoring.

In the case of visual monitoring (including studies based on opportunistic sightings), caution is warranted before concluding that a reduced number of platypus sightings during drought means that population size has dropped accordingly. Instead, animals may simply be spending more time feeding at night, when they're harder to see (and fewer human observers are around to see them).

By the same token, the outcome of live-trapping or eDNA studies may plausibly be influenced by changing patterns of platypus spatial use when stream flow is reduced by drought, independent of any change in platypus abundance.

Given the looming spectre of global warming, additional fieldwork is needed to learn more about how the platypus responds behaviourally to reduced creek and river flow in different parts of its range. Meanwhile, the complete findings from the Kellaways Creek study – including the estimated length of time required for activity patterns to return to normal after flow resumed – can be downloaded from https://www.publish.csiro.au/MF/MF25030.

HOW MUCH FOOD DOES A PLATYPUS NEED TO EAT?

Most of our readers will already be aware of the fact that the platypus's idea of fine dining is a mixed plate of bottom-dwelling (or benthic) aquatic insect larvae and worms, gradually savoured over the course of 8 to 16 hours of foraging activity. Small frogs and fish may also occasionally be eaten (for example, see *PN&V* no. 88), though the platypus's ability to consume relatively large prey item is limited by the fact that it lacks true teeth, being equipped instead with rough grinding pads at the back of its jaws.

Photo: Barry Baker

As a warm-blooded and relatively small mammal that is normally active for long periods in the water, the platypus is predicted to have high energy requirements.

But what does this mean in practice – how much food does a platypus need to thrive and reproduce? And how strongly do platypus food requirements affect its conservation management?

The best available information concerning platypus food consumption relies on research conducted in captivity, most recently by Dr Jessica Thomas at Healesville Sanctuary in Victoria. By carefully measuring the amount of food (mealworms, earthworms, fly pupae and freshwater crayfish) eaten each day by two males and five females (none of which were raising young), she found that each animal typically consumed the equivalent of between 13 and 21% of its own body mass in prey items each day.

This equated, on average, to a daily energy intake of 921 kilojoules per kilogram of body weight across the entire year. Slightly less food was eaten by both sexes during the breeding season, when they apparently had other things on their mind (August to October, mean daily intake = 810 kilojoules/kg) and slightly more food was eaten in the months after breeding concluded (November to March, mean daily intake = 1007 kilojoules/kg).

Unsurprisingly, the food intake of a lactating female platypus rises sharply compared to baseline values, peaking in the final weeks before her offspring leave the nesting burrow.

For example, captive studies again conducted by Jessica Thomas concluded that daily energy intake by a female platypus in the final month of lactation rose to as much as 2093 kilojoules/kg, requiring her to consume more than one-third of her own body weight (36.4%, to be exact) in prey items.

These findings strongly suggest that the abundance and productivity of aquatic invertebrates are likely to be critical factors limiting both platypus population size and the number of juveniles that can be weaned annually in a given area.

Any habitat management activities that bolster the size and stability of aquatic invertebrate populations – for example, fencing out livestock to limit their access to the channel and adjoining banks, encouraging vegetation to grow on creek and river banks and along gully lines to control erosion, and tolerating the occurrence of fallen logs and branches as very positive habitat features in the water – are in this light expected to help sustain platypus population size and healthy levels of juvenile recruitment.

Given the platypus's reliance on pool habitats as places to feed when flow ceases (as described on page 2), special effort should also be devoted to mapping where reliable pools are located, working to protect their habitat quality, and ensuring that they continue to hold adequate water even in the course of protracted dry spells.

ANOTHER HAIR-TIE TRAGEDY FOR PLATYPUS

Earlier this month, a juvenile male platypus was rescued after being found to be in trouble near the juncture of Morses Creek and the Ovens River in the heart of Bright township in Victoria. Instead of engaging in normal feeding behaviour, the young male remained in the same spot in very shallow water along the bank while scratching intermittently under its neck – see https://www.facebook.com/watch/?v=1389835655665423.

Tragically, the animal was seen for several days by persons passing by who didn't realise he was in real trouble. Someone eventually contacted Chris Lehmann from Reach Out Wildlife Australia, who immediately responded. The animal was easily captured and then taken to Alpine Animal Hospital at Porepunkah, where Dr Bek and her team removed an elastic hair-tie (as shown at right). It would have encircled the animal's body for some time – long enough to have worn deeply through the skin on the right side of the animal's neck (as shown below), with an equally horrendous matching laceration caused by the hair-tie cutting into the skin behind the left front leg.

These wounds would have been rubbed and aggravated by the hair-tie every time the animal tried to move, until it was too painful for the animal to move at all. As this also meant the young male was unable to feed properly, he had nearly starved to death by the time he was rescued. After consulting with the APC and vets at Healesville Sanctuary, it was decided to transfer the platypus to Healesville Sanctuary on the same day for specialist care. Sadly, despite receiving the best possible veterinary support, he died a few hours after surgery was initiated to repair his injuries - he was simply too weak and emaciated to recover.

This is not the first time that a young platypus is known to have died due to hair-tie entanglement at Bright (see *PN&V no.* 76). The river there is a favourite spot for recreation, with popular swimming holes used by residents and visitors alike. These pools are also important foraging areas used by a substantial platypus population, members of which are highly likely to encounter hair-ties dropped carelessly in the water. However, this problem is by no means restricted to Bright: **30% of all litter-related platypus mortalities recorded since 2010 by the Conservancy have been due to entanglement in elastic hair-ties**. The answer? It's really up to you and other members of the community.

- NEVER WEAR an elastic hair-tie while swimming – leave your hair loose, or use a hair clip.
- SPREAD THE WORD that elastic hair-ties are a leading cause of horribly slow and painful platypus deaths.
- PICK UP and dispose of any hair-ties you may see lying on the ground – they're a wildlife disaster waiting to happen.

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