# Platypus News & Views

***Newsletter of the Australian Platypus Conservancy (Issue 74 – November 2018)***

## NEXT-GEN CITIZEN SCIENCE – AUSTRALIAN PLATYPUS MONITORING NETWORK

Following a 5-year pilot study, the Australian Platypus Conservancy launched its community-driven *Platypus Count* monitoring program in 2008. The basic protocol is simple: trained volunteers visit fixed monitoring sites at frequent intervals to record the number of platypus observed. Crucially, they keep track of both when animals are seen and when they are not. This allows the frequency of sightings – the average number of animals seen per site-visit – to be calculated as an index of platypus activity.

As documented regularly in *PN&V*, this program has proven its worth at a diverse range of rivers, creeks and lakes in Victoria, New South Wales and the ACT. Along with helping to describe how the distribution and abundance of local platypus populations vary through time, enough information has now been collected to enable broader scientific questions to be addressed (see page 3).

The APC is now set to build on the success of *Platypus Count* by launching its technologically more sophisticated, next-generation offspring: the Australian Platypus Monitoring Network. A dedicated website and app will promote volunteer participation across the platypus's range, provide improved training and mentoring for volunteers, and facilitate immediate uploading of sightings records in the field. Participants will also be able to obtain personalised feedback about their own monitoring results. Other persons or groups interested in waterway management or platypus conservation will be able to view the program's broader findings by consulting either a mapping interface or (if enough data are available to support more detailed analysis) bar charts.

The need for community-based monitoring based on repeated sampling partly reflects the fact that the platypus is difficult to trap and often occurs in low numbers, limiting the number of captures recorded in live-trapping surveys. By the same token, though recording opportunistic community sightings using a "dots-on-map" approach can be used to describe the species' distribution, the inherently uncontrolled nature of such sightings means that this is an inefficient way to assess fine-scale population change. Use of environmental DNA for mapping and monitoring, while promising, currently only provides information about whether or not the species appears to be present at a locality, with much remaining to be learned about how the results may be influenced by factors such as flow, season and sampling regime.

The APC is planning to officially launch the APMN in Canberra in early 2019, followed by training workshops held at a variety of locations to promote volunteer participation.

The APMN website and app are now in their final stages of development by NewtonGreen Technologies, based in Newcastle. The innovative approach and expertise of Mike Newton and his staff are very much appreciated. We also thank Peter West (website coordinator for FeralScan) for his advice and encouragement, particularly in the project's early stages.

The Australian Platypus Monitoring Network has been made possible through the very generous support of Dr Denis and Mrs Vee Saunders. We gratefully acknowledge the important contribution they've made to this project as part of their long-standing commitment to platypus conservation.

## NEW FINDINGS: PLATYPUS GENES AND EVOLUTION

The results of a fascinating study into the genetic relationships and evolutionary history of platypus populations across the species' range has recently been published in the journal *Molecular Biology and Evolution* (vol. 35, pp. 1238-1252).

Fourteen persons contributed directly to this research, which involved sequencing DNA from the entire genomes of 57 animals originating in 17 waterways in Queensland, Tasmania and New South Wales.

Following detailed analysis, the authors concluded that populations could be grouped into four distinct geographic units - corresponding to river systems in Tasmania, New South Wales, central Queensland and northern Queensland.

Each of these units was inferred to have been genetically separated from the other groups for several hundred thousand years or more, with animals in New South Wales and central Queensland appearing to be more similar to each other than to animals occupying either Tasmania or northern Queensland.

Photo courtesy of John Bundock

Interestingly, there was little evidence of genetic differentiation between rivers contained within the same geographic unit but located on different sides of the Great Dividing Range. The authors speculated that this could plausibly reflect the occasional occurrence of successful overland migration by platypus between neighbouring sets of headwaters (though no direct evidence of first-generation migrants was obtained).

Based on various lines of evidence, the authors also hypothesised that the platypus as we know it may have originated several million years ago in the early to middle Pliocene Epoch. If true, this means that the modern species evolved at a time when Australia was located close to its present global position and Australian forests were already dominated by eucalypts and wattles – around 20 million years after the appearance of the earliest known platypus-like monotremes with large bills (as inferred from fossil evidence).

One of the most unexpected findings in this study was the high prevalence of related platypus that was detected. No fewer than 28 of the 57 animals appeared to have had a family member sampled in the study, including some first-order relatives (a father and mother, her sister and two offspring encountered in the Shoalhaven River system in New South Wales) as well as some more distantly related pairs of second- and third-order relatives.

Individuals that were presumed to be related were invariably captured within the same general area, prompting the authors to investigate whether there was any evidence of inbreeding in their study animals. They concluded that certain individuals could have been the offspring of first-degree or second-degree relatives, suggesting that some degree of inbreeding may be a fairly common feature of platypus biology.

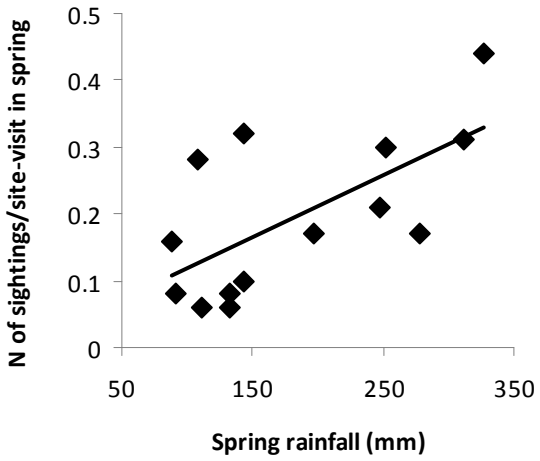
## ***PLATYPUS COUNT*: MORE NEWS ABOUT FLOW**

In the last *PN&V*, we considered whether stream flow in autumn and winter is linked to platypus activity in the following spring, due to more females breeding after wet autumn-winter periods.

To address this question, we looked at how platypus activity monitored along the Yarra River in the Melbourne suburb of View Bank varied over a 15-year period, from 2003 to 2018. The answer was "yes" – the number of platypus sightings reported in spring increased with the amount of rainfall recorded in the previous autumn and winter, which in turn was linked to the amount of flow in nearby parts of the Yarra.

Can platypus activity also be influenced by the amount of flow occurring in the same season? Many persons have mentioned to us that platypus sightings tend to increase when substantial rain has fallen and a river is running higher than usual. This could partly reflect the fact that aquatic insects (which typically make up the bulk of the platypus's diet) are more difficult to find and capture in a fast current, thereby forcing platypus to work longer hours and perhaps also forage over larger areas than usual. In addition, observations made in the course of detailed radio-tracking studies suggest that platypus may tend to initiate exploratory movements when rivers rise, possibly because deeper water reduces the risk of predation when a platypus travels through an unfamiliar area.

As illustrated in the graph below, the mean (or average) frequency of platypus sightings recorded since 2003 at View Bank in spring increased significantly with the amount of spring rainfall, with only a 2% statistical likelihood that the calculated trend line is due to chance.




Interestingly, a significant positive relationship between the frequency of platypus sightings and concurrent rainfall was also found to apply in summer and autumn, but *not* in winter. This plausibly reflects the fact that winter in Victoria marks the period just before and at the beginning of the platypus breeding season. As mentioned in the last *PN&V*, behavioural monitoring conducted at Healesville Sanctuary in Victoria has shown that adult male activity starts to ramp up about three months before mating. In the wild, this is likely to be linked to a deep-seated imperative to establish and maintain a breeding territory that provides access to as many adult females as possible – regardless of how much rain falls over winter.

These findings have practical implications for platypus monitoring. Firstly, they indicate that sightings records collected in the months before and at the start of breeding may provide the best (most easily interpreted) basis for evaluating how platypus numbers change over time. As well, they suggest that effects of flow need to be taken into account when tracking platypus numbers using any technique that is sensitive to altered activity - including setting nets.

## YABBY TRAP UPDATE

In *PN&V* No.72 we reported that Victoria will ban the recreational use of opera house traps (OHTs) along with other types of enclosed yabby nets in all waters, both public and private, from 1 July 2019. Unfortunately, the news came too late to save the lives of seven platypus found drowned in a trap at Werribee in early September (see photo at right). We're also disappointed that the remaining state and territory governments have yet to follow Victoria's sensible example in aligning its yabby trap policy with those in Tasmania and Western Australia, where OHTs cannot be used.

We understand that the ACT is currently considering implementing a ban as part of a general review of angling regulations. In New South Wales, despite a ban being recommended by the ministerial advisory committee on recreational fishing, no action has yet been announced. In Queensland, the relevant minister has ruled out considering a general ban at this point in time.

South Australia and the Northern Territory both allow OHTs to be set in *all* waters, posing a major risk to water-rat (or rakali) populations. The recent discovery of seven rakali drowned in one OHT in northern Victoria (see photo at right) again highlights how lethal these traps can be. Given that a platypus was recently sighted in the lower Murray River system for the first time in many years (see *PN&V* No.72), South Australia urgently needs to consider enacting a ban to protect that species as well as water-rats.

Meanwhile, we ask everyone to keep their eyes open for illegal yabby traps – especially over the summer holiday period – and report them at once to local fisheries or wildlife officers.

## EARLY POLLING SUCCESS FOR CANBERRA RAKALI SURVEY

The APC's community-based rakali survey in the Greater ACT Region was launched at the Australian National University in August, with much appreciated support from the Field Naturalists Association of Canberra, National Parks Association and (especially) the Wettenhall Environment Trust. Since then, the number of new rakali sightings that have been reported greatly exceeds (by a factor of more than five) all previous official records for the ACT since 2000. Lake Burley Griffin and Lake Ginninderra have emerged as clear hot-spots for the species, with fewer reports received for Lake Tuggeranong and the Murrumbidgee River and its tributaries. The survey will continue until mid-2019, with more spotting and information sessions planned for April and May, so please continue to send all of your recent rakali sightings to platypus.apc@westnet.com.au.

Australian Platypus Conservancy

**PO Box 22, Wiseleigh VIC 3885**
**(03) 5157 5568 platypus.apc@westnet.com.au**
**www.platypus.asn.au**
**Facebook: Australian Platypus Conservancy (Official)**

*Platypus News & Views* (formerly *Ripples*) is published by the Australian Platypus Conservancy.
ABN 64 255 612 676 Print Post Publication Number 335708/0022