# Platypus News & Views

***Newsletter of the Australian Platypus Conservancy (Issue 70 – November 2017)***

## PLATYPUS GO WITH THE FLOW

Environmental water – defined here as water that is stored behind dams and then released to support river health – is a carefully regulated and often scarce resource in Australia. To maximise its benefit to river ecosystems, detailed knowledge is needed about how changes in flow affect both plants and animals.

To provide a better understanding of the effect of flow on platypus reproductive success, Melody Serena (APC) and Tom Grant (University of New South Wales) recently worked together to analyse four decades of platypus live-trapping records collected by Tom at his study area in the upper Shoalhaven River, located about 70 km southeast of Canberra in the rural southern tablelands of New South Wales.

The analysis revealed a significant positive relationship between the amount of daily river flow in the five months before the start of the platypus breeding season (March to July) and both the percentage of females that subsequently raised young and average litter size.

Platypus lactation in this region typically ceases by the end of February or early March, so March to July represents the critical period for females to build up fat reserves before potentially embarking on a subsequent annual round of reproduction in August or September.

Painstaking fieldwork by Tom Grant and Richard Marchant (Museum Victoria) has previously shown that production of platypus food resources (in the form of aquatic invertebrates) increases with the amount of flow in the upper Shoalhaven River. It's therefore reasonable to conclude that the positive relationship between daily flow volume and platypus reproductive success is mediated by food availability: more food in autumn and winter results in plumper females that are more likely to ovulate during the late winter-early spring breeding season and produce more eggs when they do.

Melody and Tom's analysis also indicated that platypus reproductive success can be reduced if excessively high flows occur when juveniles are confined to nesting burrows.

The likelihood that juveniles drown when a river rises presumably varies with the height of nesting chambers in the bank as well as the duration of peak flows. Lactating females typically block the nesting burrow's entry with a series of compacted soil 'pugs' whenever they leave or return to a nest containing small juveniles. However, this practice isn't guaranteed to protect offspring in all circumstances: saturated pugs are unlikely to exclude water for long and, in any case, females have to breach pugs to attend and feed their young. Furthermore, mothers apparently cease pugging burrows around the time that juveniles are old enough to start venturing outside.

In practice, the Shoalhaven analysis found that juveniles failed to be captured in years when bankfull flows occurred in the study area in late November or early January. Widespread reproductive failure was also linked to a much lower spike in flow in late December, roughly three weeks before juveniles begin emerging from nesting burrows in this system.

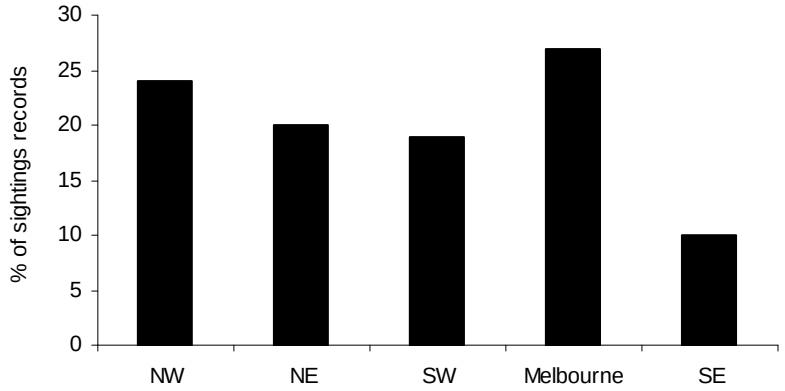
Interestingly, the relationships identified between flow and platypus reproduction in the upper Shoalhaven River also appear to apply to platypus populations occupying urban streams near Melbourne (see *PN&V* no. 58) – suggesting that they may be widely relevant to this species.

## VICTORIAN RAKALI SURVEY RESULTS

The Australian Platypus Conservancy recently completed a community-based survey to assess the distribution and status of the Australian water-rat or rakali in Victoria (see *PN&V* no. 65). The project generated nearly 400 new sightings reports for the years since 2000 (a 74% increase as compared to the sum of all previous records) along with some earlier sightings.

This information was then collectively analysed to assess the distribution and status of water-rats by region and river basin. Data relating to the incidental captures of rakali in APC platypus survey nets were also summarised and compared with the sightings-based results.

The study confirmed that water-rats are widely distributed across Victoria. Recent reliable sightings were reported for 26 of the 29 officially designated river basins in the state – the only exceptions were the Corangamite Basin (which is dominated by more or less highly saline lakes and their small inflowing streams) and the very dry Millicent and Mallee Basins. However, 12 river basins or coastal areas accounted for 80% of total sightings records, with particularly high numbers of reports received for the Yarra, Loddon, Goulburn, Barwon, Werribee and Glenelg river systems. In addition, a large number of reported sightings originated in coastal Victoria, including the Gippsland Lakes. Considered on a broad geographic basis, water-rats were most often seen in and near Melbourne (presumably at least partly reflecting the large number of human observers living there). This was followed by rivers in northwestern Victoria, including sites along the Murray River. The lowest number of sightings was reported for rivers in southeastern Victoria (see graph below).




Water-rats were most often seen in or next to rivers and creeks (51% of records), followed by coastal beaches and estuaries (19%) and natural or manmade lakes and reservoirs (18.5%). Though fewer reports originated in wetlands or morasses (7%) or irrigation channels (4%), rakali population density was often described as being very high in these habitat types, with numerous animals seen over many years. Only 0.5% of sightings occurred at sites lacking obvious nearby surface water.

Water-rat mortalities were described in 56 reports. By far the commonest mortality agent to be identified was use of enclosed yabby traps or craypots, which accounted for around 40% of incidents where the causal agent was listed. Other contributing factors included use of drum and eel nets, predation (by pet cats and dogs or wild foxes), and use of snap traps or poison targeting introduced pest rodents. A number of respondents also indicated that water-rat numbers had been known to decline in response to severe flooding and/or extended drought.

A scientific publication summarising the study's complete findings is currently being prepared so management authorities and community conservation groups can target their activities better on behalf of water-rat conservation.

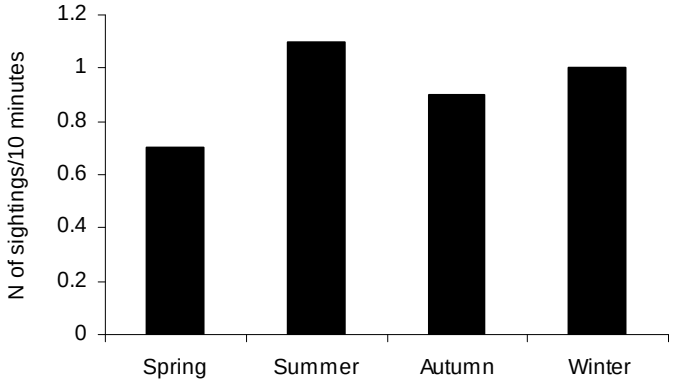
The Victorian Rakali Survey was made possible by the support of the Norman Wettenhall Foundation's Small Grants Program.

## ***PLATYPUS COUNT* UPDATE: SNOWY RIVER**

The Snowy River is one of Australia's largest and most iconic river systems, arising on the flanks of Mount Kosciuszko in New South Wales and flowing south to reach the sea at Marlo in Victoria. Along the way its waters are captured by large dams built in the 1950s and 1960s as part of the Snowy Mountains Scheme: a massive infrastructure project that aimed both to generate hydroelectricity and send most (up to 99%) of the flow carried by the upper reaches of the Snowy River to irrigation districts in the Murray and Murrumbidgee River basins.

Sue Fabish joined *Platypus Count* in 2014 to track platypus sightings at the Snowy River Holiday Park in the village of Dalgety. The Holiday Park is located roughly 25 km downstream of Lake Jindabyne, which in turn marks nearly the farthest downstream point where water is diverted from the Snowy River via structures built by the Snowy Mountains Scheme. As shown in the photo at left, Sue's monitoring area consists of a large weir pool formed behind a low wall built across the channel. The pool's normally calm surface provides excellent viewing conditions for detecting platypus as they swim about and dive for food.

The graph below shows how the mean (or average) frequency of platypus sightings at Dalgety has varied by season in the period from September 2014 to August 2017. Although platypus are seen quite readily throughout the year, the peak viewing period appears to be in summer – consistent with abundant foraging activity at this time of year by one or more females that are busy raising young in nearby burrows. When averaged over the entire year, Sue recorded slightly more than 0.9 platypus sightings per 10 minutes of observation time, with most of her monitoring activity occurring before 8 am or after 5 pm.




The occurrence of a sizable platypus population in the Dalgety weir pool has been confirmed by the results of recent live-trapping studies carried out by Tahneal Hawke and Gilad Bino as part of a major platypus research initiative co-ordinated by the University of New South Wales. Their surveys have resulted in 19 animals being marked to date at this site, including a number of possible breeding age females. The hypothesis that valuable platypus habitats are found along the Snowy River upstream of Kosciuszko National Park is also supported by the results of *Platypus Count* monitoring conducted from 2011 to 2013 by Richard Valler and Elena Guarracino at Ironmungy Nature Reserve, approximately 15 km downstream of Dalgety. On average, they recorded 0.8 platypus sightings per 10 minutes of observation time, i.e. only marginally lower than the frequency recorded at the Dalgety weir pool.

## TICK OF APPROVAL FOR STUDENT'S PLATYPUS STUDY

The platypus has a well-deserved reputation for being a difficult species to study in the wild. In particular, platypus live-trapping methods are time-consuming and physically demanding. They require specialised knowledge and equipment to carry out and are closely regulated by animal ethics committees and state wildlife and fisheries authorities. In turn, this mainly restricts their use to professional biologists.

Alternatively, the Australian Platypus Conservancy has demonstrated that using visual methods to describe how platypus activity is distributed in the wild is far more effective than previously thought. As a result it has become feasible for a wide range of persons to collect useful local information pertaining to how well the animals are doing in a specific area.

Lila Moore, a year 8 student, exemplifies how students can successfully undertake such a project. She was inspired to start the work after spotting platypus in the Brogo River near Bega, New South Wales. She then contacted the APC for advice about how to structure a study, and also obtained backing from the Sapphire Foundation (which provides scholarships to enterprising students living in the Far South Coast region).

Lila decided to record platypus sightings systematically in two contrasting one-kilometre sections of the Brogo River after first describing their respective habitat conditions - one being fairly pristine (see photo above) and the other being substantially modified by human activities.

Lila found that twice as many platypus sightings were recorded in the fairly pristine site as compared to the modified site, helping to confirm that the platypus is a good environmental indicator species. Her reported frequency of sightings has also provided benchmark values that can be compared with the results of subsequent studies at the same sites – or with findings from waterways of similar size located in other areas.

We congratulate Lila on a great piece of work and commend the Sapphire Foundation for supporting such a worthwhile project. The APC also continues to be happy to provide initial advice to anyone who may be inspired to take up the challenge of providing and sharing visual survey results for their local platypus population.

Australian Platypus Conservancy

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