

# Platypus News & Views



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*Newsletter of the Australian Platypus Conservancy (Issue 62 – November 2015)*

## **eDNA: AN EMERGING TOOL TO DETECT PLATYPUS**

The platypus is an exceptionally challenging species to survey and monitor. These animals spend most of their time either underwater or in underground burrows, and are mainly active at night. They don't call loudly, build visible nests, or deposit piles of food debris or scats in obvious places after feeding – it's a rare and unexpected occurrence to even encounter a platypus footprint. They cannot be attracted through audio playback and do not trigger infrared monitoring cameras. It's also not practical to provide appropriate food bait (in the form of small living aquatic invertebrates) in platypus survey nets. This means that any sensible platypus will do its best, once it's been captured, to never be captured again.

In 2008, a ground-breaking study was published on the use of eDNA – DNA shed into the environment in faecal material, urine, skin cells, etc. – to detect the occurrence of invasive bullfrogs in French ponds. The technique can basically be summarised as follows: (1) collect water samples, (2) extract eDNA from the water, (3) use biochemical and genetic wizardry to see if a target sequence of DNA found only in the species of interest occurs in one or more samples. Since the bullfrog study, eDNA has been used with considerable success to detect the presence of a wide range of organisms occupying freshwater habitats, including fish, salamanders, snails, crayfish and even invasive Burmese pythons in Florida.

However, before getting too carried away, it's worth noting that studies involving eDNA can generate misleading findings, either positive or negative. Water samples obtained at one site can become contaminated with eDNA originating at another site, either when samples are being obtained in the field or when they are later processed in a lab. Erroneous results can also occur because of problems arising during DNA analysis, including inhibition of key biochemical steps by commonly occurring natural compounds, such as humic acids.

In addition, given that eDNA takes awhile to degrade after being shed into the environment, it's clearly possible that it may be carried downstream in running water to sites where the target species isn't actually found. The distance over which this can occur presumably will vary with flow velocity as well as the amount of time elapsing before eDNA breaks down. In practice, a recent lab study found that tadpole eDNA mostly degraded within the first 3 to 10 days, but sometimes remained detectable at 58 days (especially in cold, alkaline water with low exposure to ultraviolet light, such as could occur in shaded habitats). However, much more research will have to be carried out, both in the lab and the field, before reliable generalisations about eDNA transport in natural systems can be developed.

For now, the consensus seems to be that use of eDNA is unlikely to replace traditional monitoring methods for animals inhabiting rivers and streams, but is appropriately viewed as being a complementary tool - particularly in situations where there's a need to quickly assess if a cryptic or rare species is present somewhere within an extensive area.

In the case of the platypus, this is particularly likely to apply if the question of interest is whether or not the species survives in a stream or river system where numbers are known to have declined dramatically, particularly if there's little or no possibility that populations occur farther upstream to complicate the interpretation of positive samples.

## PLATYPUS-FRIENDLY ANGLING

The lazy days of summer typically see an upsurge in recreational angling. In many ways fishing is an ideal leisure activity – challenging yet relaxing and providing a delectable product.

When dropping a line in freshwater rivers and lakes, it's important that anglers realise that a platypus can easily become accidentally snagged on a fishing hook, including artificial lures. In most cases the hook becomes lodged in the bill, though sometimes in a webbed front foot.



Unlike a duck's bill, a platypus's bill is fleshy and sensitive. This reflects the fact that a platypus shuts its eyes when it dives and relies on special sensory systems in its bill to find its prey. In human terms, it would be like getting a hook caught in a combined thumb, lip and eyeball! There are also many known cases in which a platypus has drowned or died from exhaustion after line trailing from an embedded hook became tangled around a submerged branch or root.

If a platypus starts feeding nearby while you're out angling, the best response is to move a short distance upstream or downstream to avoid the animal (or stop fishing for a few minutes until the platypus itself moves away).

If you do happen to hook a platypus, by far the most humane course of action is to reel the animal in and get the hook out. When handling a platypus, take great care to avoid the poisonous spurs of adult males. These structures are located on the inner ankle of the hind legs and resemble the canine teeth of a small to medium-sized dog in terms of their length (around 15 mm) and shape (slightly curved). Although platypus venom is not life threatening, it can cause intense pain and severe swelling.

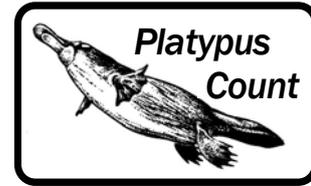
Unless you know for certain that a platypus is not equipped with spurs, *never* place your hands under the animal or use your legs or arms to support it from below. Instead, either hold the animal firmly down against the ground while you get the hook out or (particularly if you're alone) consider first confining the animal inside a rolled-up towel or jacket. To lift a platypus safely, grip it firmly around the end half of the tail but *not* the tail base, which a male can reach with his spurs. While holding a platypus in this way, you should be able to see if it's an adult male, a non-venomous juvenile male (equipped with stubbier, more or less cone-shaped spurs) or a female (no spurs visible).



Another way in which anglers can make a real difference to platypus conservation is to ensure that broken or tangled lengths of fishing line are always picked up and taken home. Although the platypus's front feet are very good at paddling, they have virtually no ability to grasp or grab objects. A loop of fishing line that finds its way around a platypus's head will therefore work its way back along the body until it can't go back any farther and then stay there, gradually cutting through the skin and underlying muscle. To safeguard platypus and other wildlife, the only really safe approach is to prevent all discarded line (and other litter) from being left in or near waterways.

Finally, enclosed yabby traps (such as opera house traps) drown platypus and are therefore banned from public waters in most parts of the species' range. Safe and legal alternatives include various types of lift net or string baited with a piece of meat (used along with a dip net).

## PLATYPUS COUNT: MURRAY RIVER NEAR ALBURY



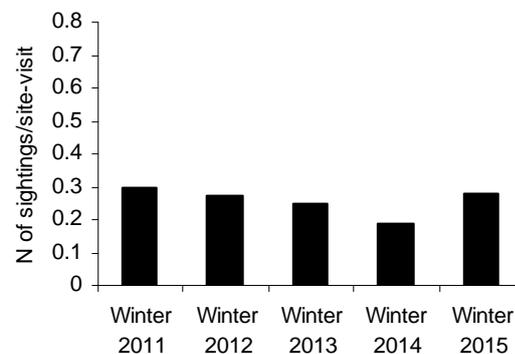
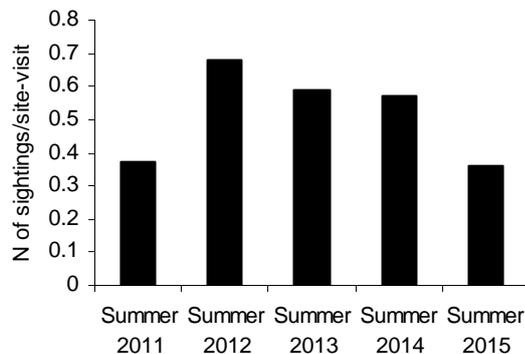
The Murray River at Albury-Wodonga is a large water body by any standard, conveying at least 1200 megalitres of water downstream each day. After a major storm, the channel can accommodate flows of up to 25,000 megalitres a day without flooding.

When the Conservancy agreed in 2010 to develop a platypus monitoring program in this part of the Murray on behalf of recycled paper manufacturer Norske Skog, there was therefore no question that the best available methodology would rely on visual surveys rather than setting nets.



No clear trend (either up or down) was evident in the frequency of platypus activity recorded from 2010 to 2015 across the study area, which encompassed several kilometres of channel near the Hume Highway. In turn, this suggests that the number of platypus inhabiting the study area was reasonably stable over this period.

*Platypus Count* volunteers have been involved in monitoring the species at a number of other places between Albury-Wodonga and Lake Hume since 2010. The graph below summarises the mean (or average) frequency of platypus sightings recorded annually in summer and winter at Mungabareena Reserve, which is located roughly 15 kilometres upstream of the APC's study area.



There is again no reason to believe that platypus activity has consistently increased or declined in this section of the Murray River over the last five years: the frequency of summer and winter platypus sightings in 2015 are nearly identical to the frequencies recorded in 2011. Some of the intervening year-to-year variation may reflect corresponding fluctuations in population size. However, a number of other factors may also have played a part.

For example, platypus might have to work longer hours to find food in one summer than another, resulting in their becoming more diurnal on average and hence more likely to be spotted by human observers. In addition, the best or easiest places to find tasty macro-invertebrates might vary from one year to the next, changing the way animals apportion their time along the river in relation to viewing spots. Last but not least, factors that affect how easy it is to spot a platypus – such as high winds and water turbulence - could also plausibly contribute to year-to-year variation in the number of sightings.

## **NEW BOOK: PLATYPUS – WORLD’S STRANGEST ANIMAL**

Platypus lovers will be delighted with this new book, written and illustrated by award-winning wildlife filmmakers Elizabeth Parer-Cook and David Parer. It provides an in-depth introduction to the world of the platypus (and its closest relative, the echidna) and describes where in Australia you can see this elusive species. The book combines up-to-date scientific information with stunning photographs taken in the wild, including images of courting platypus couples and young platypus interacting with their mother underground in a nesting burrow.

*Platypus – World’s Strangest Animal* has been published as a hardback volume, with a recommended retail price of \$39.95, including GST. It features 170 colour photographs and over 10,000 words of text. The book (ISBN 9780987328915) is available directly from [www.zaurorabooks.com](http://www.zaurorabooks.com). It can also be obtained at many zoos, wildlife parks and museums, and from bookshops, Booktopia and Book Depository websites. It is also distributed by Dennis Jones & Associates.

## **VISIT OUR FACEBOOK PAGE FOR MORE PLATYPUS NEWS**

For more news and information about platypus and rakali, visit the **Australian Platypus Conservancy (Official)** Facebook page. The page includes details of recent sightings that help to highlight an important conservation or research issue.

## **HELPING US TO HELP THE PLATYPUS**

Many of the Conservancy’s projects are funded by grants from management agencies, philanthropic trusts or corporate sponsors. Donations from individuals and environmental groups also contribute enormously to the APC’s work, by supporting platypus population monitoring, public education programs and studies that can’t otherwise be readily funded. If you would like to help out, remember that donations and bequests to the Australian Platypus Conservancy are tax-deductible.

## ***SPECIAL THANKS TO OUR SUPPORTERS!***

*The Australian Platypus Conservancy is a non-profit research and conservation organisation. The success of the APC’s programs relies on the support of businesses, management agencies and individuals sharing our interest in one of the world’s most fascinating animals. We gratefully acknowledge recent help by the following supporters:*

East Gippsland Shire ■ Gippsland Lakes Environment Fund ■ Knox Environment Society ■ Betty Lynch OAM ■ North Central Catchment Management Authority ■ Parks Victoria ■ Platypus Outdoors ■ Vee & Denis Saunders ■ Taronga Conservation Society

Australian Platypus Conservancy



PO Box 22, Wiseleigh VIC 3885

(03) 5157 5568 [platypus.apc@westnet.com.au](mailto:platypus.apc@westnet.com.au)

[www.platypus.asn.au](http://www.platypus.asn.au) Facebook: Australian Platypus Conservancy (Official)