Ripples

Newsletter of the ***AUSTRALIAN PLATYPUS CONSERVANCY***

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PLATYPUS AND POLLUTION

A number of studies undertaken by the APC along both rural and urban waterways have shown that the distribution of platypus activity along a waterway—in other words, where the animals mainly choose to spend their time—is related to the physical qualities of their habitat.

For example, platypus consistently favour sites where there are plenty of native trees and shrubs growing on the banks and organic materials (logs and branches as well as finer leaves, twigs and bark) accumulated in the channel. In contrast, the animals tend to avoid sites choked by unconsolidated sand or silt (normally created by erosion of either the waterway or nearby land surfaces).

To investigate how pollution may affect the species, researchers working for the APC and Melbourne Water recently embarked on a collaborative study to see how the occurrence of platypus populations in the greater Melbourne area varies in relation to water and sediment contaminants.

A total of 28 waterway segments (or 'reaches') were considered in the analysis. For each reach, information was available on the local status of platypus (based on live-trapping surveys), a range of water quality variables (based on long-term monitoring of urban stream health), and the concentrations of eight heavy metals found in fine bottom sediment (described by Melbourne Water ecologist Vincent Pettigrove mainly as part of his ongoing Ph.D. research).

Of the 28 reaches included in the study (extending from as far west as the Werribee River to as far east as the Tarago and Lang Lang Rivers), platypus are known to occupy 17 areas and be absent from 11 areas.

The results—presented at the international Symposium on Urban Stream Ecology held in Melbourne last December—strongly support the conclusion that pollutants can have an adverse effect on platypus populations.

Notably, sites known to support a breeding platypus population had significantly lower concentrations of dissolved nutrients (phosphorus and organic nitrogen) in water and significantly less cadmium, lead and zinc in sediment as compared to reaches without platypus.

One of the most common symptoms of an oversupply of dissolved nutrients—the rapid proliferation of strands and mats of algae—could well interfere with the platypus's ability to detect and collect food efficiently in the form of aquatic insects and other small prey.

Many aquatic invertebrates are also known to be highly sensitive to the presence of lead and zinc in sediment, so excessive levels of either metal could result in less platypus food being locally available.

Clearly, an enormous amount remains to be learned about the direct and indirect impacts of various sorts of freshwater contaminants on platypus. In terms of their conservation, a particularly important priority is to refine our knowledge of the animals' tolerance of a range of common pollutants—that is, the maximum level in the environment which is compatible with a productive, self-sustaining population.

In turn, this information is needed both to help set targets for improved management of stressed waterways, and develop the platypus's potential to serve as a useful indicator of waterway health.

PEERING INTO THE PLATYPUS PAST

One of the most rewarding aspects of the APC's *Platypus Care* program has been the opportunity to record information provided by longtime landowners, based on their decades of familiarity with local waterways and wildlife.

The memories of such persons often preserve a treasure trove of detail about the changing status of platypus populations.

To our knowledge, only one person can recall ever having seen platypus in the Wimmera River downstream of Jeparit in western Victoria—the animals were observed occasionally between the township and Lake Hindmarsh until about 1925, when the person was 10 years old. The animals were still abundant enough in the early to mid-1920's that a boy actually brought a platypus to school one day after capturing it at the edge of Jeparit township. The headmaster, very sensibly, made him return the hapless animal immediately to the river!

In the Avoca River upstream of Avoca township, platypus are reported to have been widespread and abundant up until the First World War (based on information passed from father to son), with the animals continuing to be seen fairly regularly at a few popular fishing holes until about 1940. The animals' decline is attributed to a change in river structure linked at least in part to events happening halfway around the world: with the men gone to war, rabbits proliferated and the river banks were denuded of low-growing plant cover. The ensuing erosion produced enough sediment to clog the channel and fill most of the deeper holes—and the numbers of fish as well as platypus dwindled.

Along Cardinia Creek (a small, self-contained catchment draining directly into Western Port, southeast of Melbourne), landholders have reported that platypus were observed regularly in the stream's upper reaches until about 20 years ago. This timing suggests that platypus may plausibly have disappeared in the wake of the 1983 "Ash Wednesday" bushfire, a massive firestorm which devastated the Cardinia valley. Even if relatively few platypus died due to direct exposure to flames and/or extreme heat, mortality resulting from increased post-fire predation (following the destruction of vegetation cover on the creek banks) and other adverse impacts (such as the introduction of substantial quantities of ash to the channel) may have been enough to extirpate the local platypus population.

Platypus Care is a two-year initiative, so persons can (and are encouraged to) continue providing details of platypus sightings to the program through the end of 2004. All records are entered into a secure database: to protect human privacy and ensure that the animals themselves are not disturbed, specific locality details remain strictly confidential.

Persons wishing to contribute information about where platypus have been seen—either recently or in the past—can pick up a reporting form from CMA (Catchment Management Authority) offices or DSE/DPI information centres across Victoria.

Platypus sightings can also be registered either by mailing/faxing a description of when and where an animal was seen directly to the APC office or by visiting the *Platypus Care* website (www.platypus.asn.au).

On behalf of platypus conservation, particular thanks are due to all of the following for providing funding to *Platypus Care*: the State of Victoria, Melbourne Water, and the Corangamite, Glenelg Hopkins, Goulburn Broken, North Central, North East, West Gippsland and Wimmera CMA's.

Did You Know That....

The platypus's front feet are equipped with blunt claws that can be used to dig or remodel a burrow at the rate of around 0.5 metre per hour. Radio-tracking studies have shown that an adult will most typically occupy several different burrows (up to about a dozen) over a period of a few weeks.

OUTFOXING THE PREDATORS

The platypus is believed to have been subject to predation by relatively few kinds of terrestrial animal at the time of European settlement. Based mainly on information provided by early naturalists, there is reason to believe that platypus were sometimes eaten by birds of prey such as eagles, and large pythons and goannas.

Under the heading of native aquatic predators on platypus, there is at least one documented case of a platypus carcass being found in the stomach of a Murray cod. As well, it has been suggested that predation by saltwater crocodiles may contribute to the absence of platypus in Australian tropical waterways (north of about Cooktown).

It also seems likely that platypus continue to be killed occasionally by Australian water-rats (*Hydromys chrysogaster*), given that these highly carnivorous rodents have been observed preying successfully on waterbirds such as ducks and grebes.

In particular, it would not be surprising if water-rats are sometimes responsible for attacking small juvenile platypus in their natal burrow. However, the fact that adult females characteristically seal the tunnel leading to their young with a series of hard-packed soil plugs presumably is effective in deterring the majority of would-be intruders. In any event, it is certainly the case that platypus co-exist with water-rats along many different waterways, large and small.

Unfortunately, the introduction of non-native mammals to Australia in the last 200 years appears to have increased the number of platypus predators significantly. Strong circumstantial evidence points to the fact that both cats and dogs will sometimes kill a platypus, particularly near towns. As well, the European fox is almost certainly taking a toll on the species in both urban and rural environments.

An example of the threat provided by dogs and foxes was seen in December 2003 when a dead female platypus was recovered about 50 metres from Monbulk Creek at Rowville, in Melbourne's southeastern suburbs. Importantly, Monbulk Creek supports the only reasonably large platypus population surviving in the Dandenong Valley. APC surveys undertaken since 1996 have shown that about 30 adults occupy this waterway, with most individuals found in the upper reaches around Belgrave.

To help boost platypus numbers, work to improve habitat quality along lower Monbulk Creek has recently accelerated, most notably in association with the development of the Waterford Valley golf course.

In this context, the December mortality was particularly disappointing given that the dead animal was the first female to be found in the lower part of the creek since substantial habitat restoration work began to be carried out.

By conducting an autopsy, APC researchers were able to establish that the dead female's skull had been crushed. Puncture wounds were also present on the neck, consistent with having been grabbed and/or carried in the mouth of a fox or fox-sized dog.

The female was first recorded in the rehabilitated area in April 2003, when she was classed as a juvenile (born in the spring or early summer of 2002, presumably somewhere farther upstream). A Trovan microchip transponder implanted when the animal was first encountered enabled the corpse to be identified accurately.

The young female seems to have done well in the intervening eight months, given that her weight increased from 930 grams to 1170 grams and she was in excellent physical condition

at the time of her death. It seems likely that she would have eventually gone on to breed successfully, thus further boosting platypus numbers along the lower reaches of the waterway.

Programs to reduce fox numbers and minimise unsupervised (or poorly supervised) activity of pets near waterways are both expected to assist platypus conservation.

However, the most effective long-term solution to the problem of predation may well lie in eliminating opportunities for foxes or domesticated predators to access the water's edge easily. The presence of dense shrubs and lower growing plants overhanging the banks of rivers, creeks and ponds provides vital protective cover for a large range of potential prey species, including platypus.

In addition, the fact that foxes often use cleared tracks to travel around their home range means that bicycle routes or walking paths should normally be located at least 15 metres from the banks of waterways, especially in areas where the water is characteristically shallow.