

2019 Australian Wildlife Society

University of NSW Wildlife Ecology Research Scholarship

The 2019 Australian Wildlife Society (AWS) Wildlife Ecology Research Scholarship was awarded to UNSW School of Biological, Earth and Environmental Sciences PhD student Tahneal Hawke for her research on platypus (*Ornithorhynchus anatinus*), assessing long-term changes in platypus populations and the current impacts of river regulation on platypus population dynamics.

Another dam diet: the impact of river regulation on platypus macroinvertebrate food sources

Tahneal Hawke

Introduction

The platypus is a unique semi-aquatic monotreme endemic to rivers and creeks of eastern Australia. There has been emerging evidence of declining platypus numbers, particularly in the Murray-Darling Basin, which has resulted in the recent IUCN Red Listing of 'Near Threatened'.

I have been studying platypus populations in rivers across the east coast of New South Wales and Victoria for the last three years. Given that the distribution of the platypus overlaps significantly with Australia's most regulated rivers, I have been attempting to assess the impacts of dams and river regulation on platypus populations, using a novel method of DNA metabarcoding of cheek pouch samples, to assess the impacts of river regulation on platypus diet across their range.

The platypus feeds exclusively on macroinvertebrates, which have been shown to be heavily impacted by altered flows and temperatures on regulated rivers. Dietary studies of platypuses are limited, given the difficulty of underwater observational studies on a primarily nocturnal species. Additionally, food items in the gut contents and faeces of the platypus are mostly unidentifiable. Platypuses store partially masticated food in their cheek pouches inside their mouth; consequently, most dietary studies have been primarily



Photo of Tahneal setting nets to capture platypuses.

reliant on manual cheek pouch investigations. My research, thus far, has discovered significant detrimental impacts of heavily altered flow regimes downstream of large dams to platypus populations. However, we are waiting for the results of the DNA sample sequencing to determine the impact of river regulation on platypus diets.

Methods

We captured platypuses using either mesh or fyke nets, for collection and examination of cheek pouch material. Check pouch samples were collected from 130 platypuses in New South Wales and Victoria.

In New South Wales, samples were collected from upstream of the



A platypus captured during studies on the impacts of river regulation.

Jindabyne Dam on the Thredbo River, and downstream of the dam on the Snowy River.

In Victoria, samples were collected from upstream and downstream of Dartmouth Dam on the Mitta Mitta River, and the free-flowing Ovens River.

Cheek pouch samples will be assessed using DNA metabarcoding,

a method shown to be highly effective for species identification. Genetic material is extracted, amplified, and sequenced for taxonomic identification, obtained by matching sequences to reference DNA barcodes in the Barcode of Life Database (BOLD). We are currently waiting for the results of the sample sequencing.

Next steps

Once sample sequencing is complete, the dietary composition will be compared between free-flowing and regulated rivers, upstream and downstream of dams. The dietary composition will also be compared to estimates of population sizes and metrics of individual condition, to evaluate if there is a relationship between river regulation, diet, and health. The outcomes of this research will have important implications for the management of regulated rivers. If the composition of the platypus diet differs upstream and downstream of dams, it may indicate that the impacts of river regulation on macroinvertebrates are a causal factor in their decline downstream of dams. Identifying factors that contribute to these declines is critical for the future of the species and will allow environmental managers to reassess the timing and volume of flows to benefit macroinvertebrate populations and platypuses.

Local platypus knowledge from members of the community is also highly beneficial for providing information about the presence and absence of platypuses across these waterways. Uploading sightings to the Atlas of Living Australia or the platypusSPOT app can assist in ongoing platypus research by contributing to our understanding of their distribution, habitat requirements, and threats.



Collecting the cheek pouch sample from a captured platypus.



Tahneal Hawke processing a captured platypus.