

2019 Australian Wildlife Society

University of Western Sydney Wildlife Ecology Research Scholarship

The 2019 Australian Wildlife Society (AWS) Wildlife Ecology Research Scholarship has been awarded to Western Sydney University, School of Science, PhD student Kristen Petrov for her research on the ecology of the imperilled Bellinger River snapping turtle (*Myuchelys georgesii*).

Turtles in Trouble: the decline of the Bellinger River snapping turtle (*Myuchelys georgesii*)

Kristen Petrov

In freshwater ecosystems, turtles fill multiple ecological roles as herbivores, omnivores, top predators and scavengers, and historically occurred at high population densities. Their ability to consume large quantities of carrion (dead animal matter) makes them excellent decomposers, and facilitates nutrient cycling within an ecosystem, helping to maintain water quality.

The persistence of turtles over the past 200 million years has been attributed to their long lifespans (i.e. 20-100 years), high reproductive output, and morphological defence against predation (i.e. protective shell). Despite these adaptations, turtles are among the most threatened vertebrate groups, with 61 percent of the world's 356 turtle species threatened or extinct. The slow maturation time of turtles means that threats to each of the life-stages of turtles (i.e. adult mortality or nest mortality) can be detrimental to species survival. Human mediated environmental change, including habitat destruction and modification, invasive species, overharvesting, climate change, pollution and disease, have all contributed to the plight of turtle populations globally.

Australian freshwater turtles are not immune to the global decline, with almost half of the 25 extant species of freshwater turtles in Australia listed as Vulnerable, Endangered, or Critically Endangered.



Juvenile Bellinger River snapping turtle. Photo: Kristen Petrov

The Bellinger River snapping turtle is one Australian freshwater species threatened with extinction. The Bellinger River snapping turtle is a species of short-necked turtle, endemic only to the Bellinger River, in northern New South Wales, Australia. The population was once estimated to be ~ 4500 individuals and was considered stable with no

apparent risk of extinction. However, in 2015, the population experienced a mass mortality event likely caused by a novel nidovirus, termed the Bellinger River virus. The Bellinger River virus affected only adult turtles and killed the majority of the breeding population. No other co-occurring turtle species was affected by the disease, including

the Murray River turtle (*Emydura macquarii*) or common long-necked turtle (*Chelodina longicollis*). Current population estimates suggest ~ 150 Bellinger River snapping turtles remain in the Bellinger River, most of which are juveniles. The rapid decline of more than 90 percent of the historical population places the species at imminent threat of extinction. With a wild population comprised predominately of juveniles, the road to recovery will be long, as juveniles of the species must survive to adulthood to reproduce.

Conservation efforts, including a captive breeding program, are underway for the species, and understanding the threats to the remaining Bellinger River snapping turtles is crucial to the species' survival.

One of the ongoing threats is the presence of the non-native Murray

River turtle (*Emydura macquarii*), which was first detected in the Bellinger River in the 1990s. Since the decline of the Bellinger River snapping turtle, the Murray River turtle has become the dominate turtle species in the river (~ 500 individuals inhabiting the river) and is a primary competitor to the native Bellinger River snapping turtle. Both species have similar diets and overlap in habitat in the Bellinger River, and this risk of competition may threaten the Bellinger River snapping turtle.

The Murray River turtle also hybridises with the native Bellinger River snapping turtle in the Bellinger River. The low number of Bellinger River snapping turtles and the high abundance of non-native Murray River turtles may mean that the incidence of hybridisation, and the number of hybrid individuals, will

increase. As the current Bellinger River snapping turtle juveniles reach maturity; they will be less likely to encounter an opposite-sex turtle of their kind.

The recovery of the Bellinger River snapping turtle in the wild will take years, but maintaining the current population and evaluating remaining threats is ongoing through collaborative efforts of the recovery team, including the Department of Planning, Industry and Environment, and Western Sydney University.

By understanding the threats to the long-term survival of the Bellinger River snapping turtle, this project can guide conservation and management strategies and help prevent the extinction of this iconic Australian turtle species.



Western Sydney University PhD student Kristen Petrov, with Co-Founder and Director of OzGreen, Sue Lennox.