

Rare fossil reveals prehistoric Melbourne was once a paradise for tropical pig-nosed turtles

December 11 2021, by James Patrick Rule, William Parker



Credit: Hany Mahmoud, Author provided

The pig-nosed turtle, [an endangered freshwater turtle](#) native to the Northern Territory and southern New Guinea, is unique in many respects. Unlike most freshwater turtles, it is almost completely adapted to life in water. It has paddle-like flippers similar to sea turtles, a snorkel-like "pig-nose" to help it breathe while staying submerged, and eggs that will only hatch when exposed to the waters of the wet season.

It is also the last surviving species of a group of tropical turtles called the carettochelyids, which once lived throughout the northern hemisphere. Scientists thought pig-nosed turtles only arrived at Australia within the past few millennia, as no pig-nosed turtle fossils had ever been found here—or so we thought.

A 5-million-year-old fossil from Museums Victoria's collections has now completely rewritten this story. Discovered at Beaumaris, 20km southeast of Melbourne, this fossil lay unidentified in Melbourne Museum's collection for almost 100 years until our team came across it.

We identified the fossil as a small section of the front of a pig-nosed turtle's shell, as we report today in the journal [*Papers in Palaeontology*](#). Although the fossil is just a fragment, we were lucky that it was from a very diagnostic area of the shell.

The fossil shows that carettochelyid turtles have been living in Australia for millions of years. But what was a pig-nosed turtle doing in Beaumaris 5 million years ago, thousands of kilometers from their modern range?



Artist's impression of the pig-nosed turtle swimming in an ancient river. Credit: Jaime Bran

Well, in the past, Melbourne's weather was a lot warmer and wetter than it is now. It was more akin to the [tropical conditions](#) in which these turtles live today.

In fact, this isn't the first prehistoric tropical species discovered here: monk seals, which today live in Hawaii and the Mediterranean, and dugongs also once lived in what is now Beaumaris.

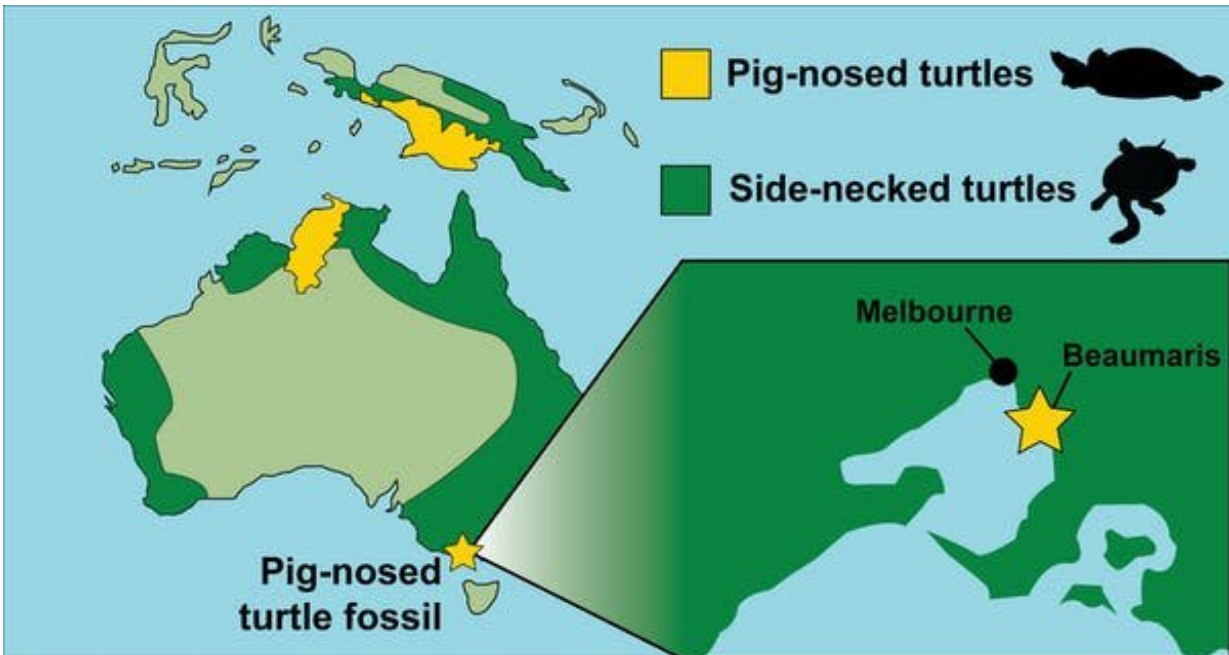
A tropical Melbourne?

Millions of years ago, Australia's eastern seaboard was a tropical turtle hotspot. The warmer and wetter environment would have been perfect for supporting a greater diversity of turtles in the past. This is in stark contrast to modern times; today, Australia is mostly home to the side-necked turtles.

Tropical turtles would have had to cross thousands of kilometers of ocean to get here. But this is not unusual—small animals often cross the sea by [hitching a ride on vegetation rafts](#).



The 5-million-year-old pig-nosed turtle fossil, in life position on the shell of a modern pig-nosed turtle. Credit: Erich Fitzgerald



Distribution of Australia's freshwater turtles today, and the location of the pig-nosed turtle fossil. Star shows where the new fossil was found at Beaumaris.
 Credit: Author provided, turtle silhouette by Aline M. Ghilardi

So where are these turtles now? Why is the modern pig-nosed turtle the last remaining species of the carettochelyids? Well, just like today, animals in the past were threatened by [climate change](#). When Australasia's climate became cooler and drier after the ice ages, all the tropical turtles went extinct, except for the pig-nosed turtle in the Northern Territory and New Guinea.

This also suggests that the modern pig-nosed turtle, already endangered, is under threat from human-driven climate change. These turtles are very sensitive to their environment, and without rain their eggs cannot hatch.

This is true of a lot of Australia's native animals and plants. In reptile species such as [turtles](#) and crocodiles, sex can be determined by the

temperature at which eggs are incubated. This is yet another factor that could put these species at risk as the climate changes.

The [treasure trove of fossils from Beaumaris](#) shows just how important Australia's previously tropical environment was for ancient animals. Southern Australia used to be home to many tropical [species](#) that now have much more restricted ranges.

Just last year, the discovery of tropical monk seals fossils from Beaumaris completely changed how scientists thought seals evolved. This shows just how much we still have to learn about Australia's prehistoric past, when it was so different from the sunburnt country we know today.

More information: James P. Rule et al, Turtles all the way down: Neogene pig-nosed turtle fossil from southern Australia reveals cryptic freshwater turtle invasions and extinctions, *Papers in Palaeontology* (2021). [DOI: 10.1002/spp2.1414](https://doi.org/10.1002/spp2.1414)

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