

Australia's extinct giant eagle was big enough to snatch koalas from trees, suggest study

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Dynatoaetus gaffae was twice the size of the wedge-tailed eagle we know today.
Credit: Mike Lee

The year is 1959. Speleologists descend a 17-meter shaft to explore the depths of Mairs Cave in the southern Flinders Ranges. Some 55 meters into the main chamber, they find fossils scattered throughout a boulder pile. Among these fossils are a claw and part of a wing bone that appear to have come from a large eagle.

Over a decade passes. An expedition to the cave, led by naturalist Hans Mincham and paleontologist and geologist Brian Daily, now arrives with the purpose of retrieving more fossils. Among the many [mammal fossils](#) they recover are another talon and most of a large bird breastbone—from the same large [eagle](#).

No more fossils of this animal are found until more than 50 years later. It is December of 2021, and a team of Flinders University paleontologists and speleologists have traveled to the cave for a single purpose—to find more of this enigmatic bird. As they descend into the cave's depths, they hope to find a few more bones. Instead, they find a [partial skeleton](#), including leg and wing bones, and a skull. With this last discovery, we were finally able to name and describe this gigantic eagle in the *Journal of Ornithology*.

History's third-largest eagle

Dynatoaetus gaffae (Gaff's powerful eagle) lived during the Pleistocene epoch, perhaps between 700,000 and 50,000 years ago. At twice the size of a wedge-tailed eagle (which it coexisted with) and with a potential wingspan of up to 3m, this species is the largest known eagle to have lived in Australia, and one of the largest continental raptors in the world.

Only two larger eagles ever existed anywhere: [Gigantohierax suarezi](#), which hunted giant rodents in Cuba, and the giant Haasts eagle, [Hieraetus moorei](#) that hunted large moa in New Zealand.

Thanks to the relatively complete skeleton from Mairs Cave, we were able to identify other fossils of *Dynatoaetus* from the Naracoorte caves in South Australia and the Wellington caves in New South Wales. It appears this species was widespread across most of southern Australia.



Exploring the depths of Mairs Cave, the place where the fossils were found.
Credit: Aaron Camens

A surprising family tree

After discovering the fossils, we investigated how *Dynatoaetus* was related to other eagles, with surprising results.

Dynatoaetus was not closely related to any modern Australian eagle. Instead, these birds (and another [fossil](#) Australian [raptor](#) *Cryptogyps lacertosus*) were related to the old-world vultures and to the serpent-eagles of south Asia and Africa.

Dynatoaetus was clearly not a vulture-like scavenger, as indicated by its large and powerful leg bones and talons, so to infer how it lived, we looked to the serpent-eagles.

Serpent-eagles, as their common name suggests, primarily hunt snakes and other reptiles. Most are small to medium-sized raptors and would have been dwarfed by Dynatoaetus.

However, there is one species in this subfamily that is an exception: the Philippine eagle. This raptor is one of the largest eagles alive today, and unlike its reptile-eating relatives, it prefers to [prey](#) on monkeys, flying lemurs, bats, birds, and occasionally young pigs or deer.



A comparison of the tarsometatarsus (foot bone) of *Dynatoaetus* and a female Wedge-tailed eagle, with scaled silhouettes of the entire animals. Credit: Ellen Mather

Strong feet for large prey

Much like the Philippine eagle and other very large raptors, the legs and feet of *Dynatoaetus* were quite robust. This strongly suggests it was suited for killing large prey, perhaps much heavier than itself.

Dynatoetus shared ancient Australia with [giant kangaroos](#) and flightless birds, the young and sickly of which would have been suitable prey. Koalas and possums would have been plentiful in the treetops, and Dynatoetus was certainly large enough to snatch them up.

This giant eagle was most likely one of Australia's top predators during the Pleistocene.

We can also find clues to potential prey via fossils found alongside Dynatoetus. [Small mammals have previously been collected from Mairs Cave](#), but the 2021 trip also recovered bones of short-faced kangaroos, wombats, bettongs, bandicoots, possums and even koalas (the only record of koalas inhabiting the Flinders Ranges), many of which were potential prey for the giant eagle.

We further found fossils of thylacines, Tasmanian devils and [Thylacoleo](#) (the marsupial "lion"), indicating Dynatoetus competed for prey with a cohort of marsupial carnivores. No one has yet identified beak and talon marks left on fossil bones from this giant raptor—but this may simply reflect that, until now, no-one was looking.

The end of Australia's megafauna

So why did Dynatoetus become extinct? It appears to have died out around the same time as much of the Australian [megafauna](#), around 50,000 years ago. Perhaps it was specialized to hunt certain large species, and when this preferred prey went extinct it was unable to adapt.

With the demise of specialist raptors like Dynatoetus and Cryptogyps, the generalist [wedge-tailed eagle](#) was left as the sole survivor of the large inland raptors.

More information: Ellen K. Mather et al, A giant raptor (Aves:

Accipitridae) from the Pleistocene of southern Australia, *Journal of Ornithology* (2023). [DOI: 10.1007/s10336-023-02055-x](https://doi.org/10.1007/s10336-023-02055-x)

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