



Why tiny frogs are croaking it in WA

The white-bellied frog in south-west Western Australia is experiencing population extinctions throughout its small range, but the driver of recent declines is a mystery.

14 January 2019 / By **EMILY HOFFMANN**.



Credit: [Emily Hoffmann](#)

Meet *Geocrinia alba* – the white-bellied frog...

They are probably not what you think of as a ‘normal’ frog. They are pretty teeny – only weighing around a gram or so as an adult – and they are entirely terrestrial, living all of their life stages on land, including even the tadpoles! Males excavate a shallow depression in moist soil and the female frogs lay a small number of eggs that form a jelly-like pool. The eggs develop into tadpoles entirely within that little jelly-filled burrow and emerge as miniature frogs a couple of months later. They will then take potentially two or three years to mature into adults.

White-bellied frogs are unique to southwest Western Australia and are only found in a small number of isolated patches near headwater streams in the Margaret River region. We estimate that the total area they occupy is less than 2 square kilometres, so you could think of them as a 'micro' endemic. And they really like it in these swampy patches. These frogs show incredibly high site fidelity: males move less than five metres in a year, on average. So, even though some populations are not physically far away from each other, genetics has shown them to be isolated, with almost no movement between populations. So, in essence, these frogs are fussy, sedentary and slow to mature; so not that dissimilar to the author!

Declining populations

Since their relatively recent discovery in the 1980's, over half the known populations of white-bellied frogs have become locally extinct. In the past, habitat clearance and land use change were clearly responsible for their decline, but more recently a dedicated team of conservation managers noticed populations being lost in areas that seem 'untouched'. These declines are more of a mystery and are continuing to occur throughout the species' range. So why are we losing populations from conservation areas that should be protected from known threats? And why do some populations seem to persist whilst their neighbours perish?

In eastern Australia, and other parts of the world, enigmatic frog declines have been linked with the notorious *chytrid fungus*, which causes the infectious disease *chytridiomycosis*. But, in Western Australia, it does not seem likely. Whilst the agent is present and has been detected in the area, it has not been linked to the white-bellied frog declines.

On the other hand, we do know that there are climatic changes happening on a regional scale in southwest Western Australia. Rainfall in the southwest has reduced by around 15% over the last 40 years. There is also evidence of increased air temperatures, declining groundwater and reduced summer flows in catchments in the area. These factors could be altering the moist and cool patches on which this species solely depends. So, are white-bellied frog declines and population extinctions linked with changes to the microclimates within their unique habitats? That is what we (a group of scientists from the University of Western Australia and conservation managers from the WA Department of Biodiversity, Conservation and Attractions) have set out to try and answer - and our preliminary results suggest the answer might well be yes (stay tuned)!

Why do we care about (these) frogs?

Frogs in general are not doing well in the current global extinction crisis. More than one in three are threatened with extinction around the globe. Research into frog declines have emphasised that each case is often unique, and thus we need to investigate and understand the drivers of decline on an individual species scale.

White-bellied frog populations are continuing to decline, and without research will likely continue toward the extinction path, without us knowing why. These specialist species are sensitive to changes and could be indicating environmental changes we are currently

unaware of, and could tell us more about how we might be affecting and shaping our world.

There's still so much we don't know about the natural world. Why do species occur where they do? How do they all interact and are they unique and important? It's hard to ask these questions when they are not there, so we must ask and learn from them now.

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