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# Australian endangered species: White-bellied Frog

## AUTHOR



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## DISCLOSURE STATEMENT

Dale Roberts has received funding from ARC grants, the Western Australia Department of Environment and Conservation, and Holsworth Trust. He is an Honorary Associate in Terrestrial Zoology at the Western Australian Museum.



The tiny White-bellied Frog lives in the swamps of south-west Australia. Perth Zoo

The White-bellied Frog (*Geocrinia alba*) is a tiny frog from south-west Western Australia, inhabiting a range of 130km<sup>2</sup> between Margaret River and Augusta. It was only discovered in the early 1980s and described in 1989.

Male White-bellied Frogs call from small depressions in wet soils during the breeding season. These wet areas are formed by seepages in swamps. The eggs are laid in jelly in the same place. The eggs hatch in the jelly and develop into frogs without feeding, relying instead on the yolk in their stomachs.

The White-bellied Frog is one of four *Geocrinia* species found across south-western Australia's wetter forest systems. All have similar breeding biology. Its closest relative, the **Orange-bellied Frog** (*Geocrinia vitellina*) lives nearby.

## Status

The White-bellied Frog is variously listed at different levels. It



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is listed critically endangered on the IUCN Red List and under the Western Australian **Department of Environment and Conservation**, and as **endangered** under the federal government's EPBC Act.



Perth Zoo

Whichever way you look at it the White-bellied Frog is a species at risk. Over 70% of likely habitat has been cleared and is now unsuitable for the frogs' specific breeding needs. Its range is heavily fragmented, and movement between populations is low or non-existent. In most of them there are fewer than 10 frogs. It is no longer found in many of the places where this species was found in the early 1980s.

## Threats

The main threats to White-bellied Frogs are activities that change their habitat, particularly the delicate seepages that they rely on for breeding.

Land clearing fragments the populations of frogs. It also modifies the structure of creeks. Slow-moving creeks with seepages are turned into well-defined channels which are unsuitable for breeding. Plantations of blue-gums have a different effect. By lowering groundwater supplies they cause breeding sites to dry up.

**Illegal marijuana crops**, which use the same wet soils as the frogs, have also disturbed the habitat. Adding chemicals and nutrients through fertilisers disrupts the growth and development of the frogs. Other agricultural impacts come

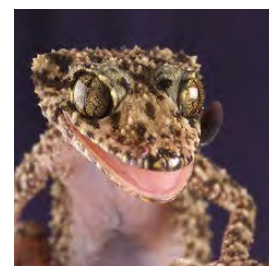


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from grazing, which destroys the seepages, and vineyards, which alter water supplies through damming.



White-bellied Frog tadpoles never leave the nest Perth Zoo

**Amphibian chytrid** has been found in White-bellied Frog populations, and is widespread across south-west Australia. Strangely it doesn't appear to be responsible for declines in White-bellied Frogs.

## Strategy

One of the early management strategies for the White-bellied Frog was to fence off the isolated populations from livestock, allowing them to recover and maintain healthy populations.

Fire is currently excluded from land managed by the Western Australian government, but proper fire management must eventually include burnoffs. Fortunately it appears the frogs can tolerate fire. Experiments show that even if fire reduces numbers locally they do eventually recover.



A frog released back into the wild Perth Zoo

**Perth Zoo** has successfully reared frogs. Frogs were raised from wild-collected eggs and released near Margaret River in 2010 and 2011. Nests in the wild suffer from predation and rearing frogs gives the frogs a better chance.

The Zoo has also successfully bred White-bellied Frogs in captivity, a significant achievement given their breeding requirements, and five of these frogs were released at the Margaret River site in 2012.

In 2000 the state and federal governments purchased a large area of private land where a number of frogs were found. This was a major breakthrough for managing the frogs and their habitat.

There's hope for the White-bellied Frog under climate change too. The species is thought to be seven million years old (using **molecular clocks**), meaning it has already survived seven million years of climate upheaval. We know that its orange-bellied relative can survive disturbance such as logging, and its likely the White-bellied Frog is the same. This suggests the species will be able to survive disturbance to its habitat caused by climate change.

## Conclusion

There is an interesting epilogue to the White-bellied Frog's tale. In the 1960s and 1970s, before the frog was discovered, large areas of its range was cleared. Paradoxically this vegetation loss may have raised the water table, creating new habitat for the frog, and artificially expanded the range.

The current decline may partly reflect loss of those new populations that arose during land clearing. It goes to show that managing this species and water is a particular challenge in a region with diverse land uses.



Perth Zoo

*Pictures courtesy of [Perth Zoo](#). Perth Zoo has successfully reared, bred and released White-bellied Frogs into the wild to increase their numbers.*

*The Conversation is running a series on Australian endangered species. See it [here](#)*

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**Bernie Masters**

environmental consultant at [FIA Technology Pty Ltd](#),  
[B K Masters and Associates](#)

I live in SW WA not far from this species' habitat and am active in the voluntary conservation movement. One reason for the precarious position of this species (plus others) is that the responsible government agency - Dept of Environment and Conservation - does not see the community as having a role on the conservation of endangered species. The DEC sees people as a threat to be regulated whereas most other parts of the world that have similar conservation problems and issues have an enlightened...

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**Don Driscoll**

Research Fellow in Ecology at [Australian National University](#)

I'm not convinced that clearing could lead to range expansion. Our genetic work implied these frogs pretty well don't move between disjunct swamps. I don't think there is any genetic evidence of recent range expansion that could reasonably be associated with land clearing.

Land clearing is unlikely to be good for these frogs. We know that the related orange-bellied frog uses areas outside of the swamps over winter. If *Geocrinia alba* does the same, then it's hard to imagine how clearing around...

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