

Frogs

Class: Amphibia (amphibians)

Order: Anura (anurans)

How many species of frogs are there?

In the world	21 families	312 genera	± 4000 species
In Australia	5 families*	28 genera*	214 species*
In Victoria	2 families	11 genera	36 species¶

* 1 introduced (Cane Toad, *Bufo marinus*)

One species, the Eastern Dwarf Tree-frog *Litoria fallax*, is native to northern NSW and Queensland, but has established suburban populations in Melbourne as a result of releases.

How long have they been around?

Oldest frog fossil in the world	Argentina	160 million years old
Oldest frog fossil in Australia	Murgon, Qld.	54.5 million years old

Where did they come from?

Australia's frogs came from three sources:

"Old" Gondwana originals	:	Myobatrachidae (= Leptodactylidae), Hylidae
"New" Asian invaders	:	Microhylidae, Ranidae
"Very new" introduction	:	Bufoidea (Cane Toad)

Victoria's frogs are all "old".

All but one occur elsewhere in Australia. The endemic species is *Philoria frosti* (Baw Baw Frog). *Litoria spenceri* (Spotted Tree Frog), long thought to be restricted to Victoria, has more recently been found near Mt Kosciusko in New South Wales.

Body size

In the world	Biggest	<i>Rana goliath</i>	West Africa	300+ mm
	Smallest	<i>Psyllophryne didactyla</i>	Brazil	10 mm
In Australia	Biggest	<i>Litoria infrafrenata</i>	Giant Tree Frog	140 mm
	Smallest	<i>Litoria microbelos</i>	Javelin Frog	16 mm
In Victoria	Biggest	<i>Limnodynastes interioris</i>	Giant Pobblebonk	90 mm
	Smallest	<i>Crinia sloanei</i>	Sloane's Froglet	17 mm

The Amphibian Research Centre

The Amphibian Research Centre is an independent organisation which receives state government support through Melbourne Water. It runs a very active program of frog rescue, conservation, research and education; and organises meetings and excursions through the Victorian Frog Group, which also publishes a newsletter.

It is housed at the Western Treatment Plant, New Farm Road, Werribee 3030; and can be contacted by phone on 9742 3764; fax 9749 7518; email arc@frogs.org.au website <http://www.frogs.org.au>

The website is packed with information and is a very good place to start with any inquiry you may have about Australian frogs.

Disappearing Frogs

Evidence has been accumulating since the early 1980s that frog populations, globally, are in decline. With about a third of species threatened with extinction, they are faring considerably worse than mammals (23% of species threatened) and birds (12% of species threatened). The most dramatic example in Australia is the Southern Gastric-brooding Frog, *Rheobatrachus silus*, world-famous because of its extraordinary reproductive biology - the female swallows the eggs and broods them in her stomach. Discovered in 1973 in south-eastern Queensland, it was apparently restricted to a small area in the Conondale and Blackall Ranges, but was abundant within this area - "you could have picked up a hundred in one night if you'd wanted to". The environment was relatively pristine and included a national park. The Southern Gastric-brooding Frog was last seen in the wild in 1980; the even more abundant Sharp-snouted Dayfrog, *Taudactylus diurnus*, vanished from the same area at about the same time. They are among a total of 8 species of Australian frog to have become extinct since the 1980s, and another 20 are seriously threatened. Most of the declines and disappearances are of montane, stream-breeding species.

In Victoria the Spotted Tree Frog, *Litoria spenceri*, seems once to have been widespread along rocky streams throughout north-eastern Victoria, but is now known from only two river systems. The Baw Baw Frog, *Philoria frosti*, has never been recorded from any locality other than the Baw Baw Plateau, but its abundance has declined massively in recent times. The Southern Bell Frog, *Litoria raniformis*, certainly declined in abundance during the 80s but there is now evidence that a few Victorian populations are recovering. On the Southern Tablelands of New South Wales, however, extensive surveys by the Canberra wildlife biologist Will Osborne have led him to conclude that the Southern Bell Frog and two additional species have become locally extinct; yet the abundance of some other species seems not to have changed. In coastal NSW the Green and Golden Bell Frog, *Litoria aurea*, closely related to *L. raniformis*, has declined precipitously. A concerted effort involving Taronga Zoo, the Australian Museum, the New South Wales Department of Environment and Conservation and local community groups is now being made to try to safeguard the remaining populations of this species.

We are unable to fully explain what is happening. Because there have been so few long-term studies we cannot even be certain as to how many of the apparent declines are real. On a short time-scale it is impossible to distinguish patterns of decline or increase from patterns of oscillation or fluctuation; for instance frogs have probably always undergone significant "boom-and-bust" cycles in response to drought and rainfall. Even where there is strong evidence that a population is in decline, the question *Is this a local phenomenon, or is it a reflection of a global change?* still confronts us. Clearly some declines might readily be accounted for by local events such as logging, increasing salinity or major bushfires. But the fact that decreases in frog abundance have been recorded on all continents has led to the idea that some global change which is hazardous to frogs may be in progress. Some of the suggestions are:

- acidification of ponds because of acid rain
- increasing levels of UV-B radiation because of damage to the ozone layer
- global warming and consequent changes in temperature regimes and rainfall
- increasing concentrations of pesticides, herbicides and other pollutants
- viral, bacterial and fungal diseases (particularly the fungal infection chytridiomycosis)
- introduction of predators (particularly fish predators of tadpoles)

There is some evidence for all of these factors in various instances, but two circumstances argue against a world-wide, block-busting frog extermination agent. In any given area some species have continued to flourish while others have declined; and there have been declines in areas which are far removed from the effects of most of these factors (e.g. the Conondale Ranges).

So the consensus is that many factors may be responsible for frog decline. Certainly in a case such as the Spotted Tree Frog we may note that much of its habitat has been subjected to natural events such as droughts, but also to altered stream-flow patterns, forestry activities, chemical use, mining (including the use of eductor dredging) and the introduction of trout. Quite enough seems to have happened to this species to account for its decline without invoking general global changes.

Checklist of Victorian Frogs

Family Myobatrachidae (=Leptodactylidae)

Crinia parinsignifera
Plains Froglet*

Crinia signifera
Common Froglet*

Crinia sloanei
Sloane's Froglet*

Geocrinia laevis
Southern Smooth Frog

Geocrinia victoriana
Eastern Smooth Frog*

Heleioporus australiacus
Great Burrowing Frog

Limnodynastes dumerili
Pobblebonk*

Limnodynastes fletcheri
Barking Marsh Frog*

Limnodynastes interioris
Giant Pobblebonk*

Limnodynastes peroni
Brown-striped Frog*

Limnodynastes tasmaniensis
Spotted Grass Frog*

Uperoleia tyleri
Tyler's Toadlet

Mixophyes balbus
Southern Barred Frog

Neobatrachus pictus
Mallee Spadefoot

Neobatrachus sudelli
Common Spadefoot*

Paracrinia haswelli
Haswell's Froglet

Philoria frosti
Baw Baw Frog

Pseudophryne bibroni
Bibron's Toadlet*

Pseudophryne dendyi
Dendy's Toadlet

Pseudophryne semimarmorata
Southern Toadlet

Uperoleia laevigata
Smooth Toadlet*

Uperoleia martini
Martin's Toadlet

Uperoleia rugosa
Wrinkled Toadlet*

Litoria verreauxi
Verreaux's Tree Frog*

Family Hylidae

Litoria aurea
Green and Golden Bell Frog

Litoria booroolongensis
Booroolong Frog

Litoria citropa
Blue Mountains Tree Frog

Litoria ewingi
Brown Tree Frog*

Litoria lesueuri
Lesueur's Tree Frog*

Litoria littlejohni
Littlejohn's Tree Frog

Litoria nudidigita
Green Stream Frog*

Litoria paraewingi
Plains Brown Tree Frog*

Litoria peroni
Peron's Tree Frog*

Litoria raniformis
Southern Bell Frog*

Litoria spenceri
Spotted Tree Frog*

*occurs in north-eastern Victoria

Frog reading (and listening!) – general

- Anstis, M.** 2002. Tadpoles of South-eastern Australia. Reed New Holland.
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Disappearing frogs

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- Campbell, Alastair (ed.).** 1999. Declines and disappearances of Australian frogs.- Environment Australia.
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- Laurance, W.F.** 1996. Why are Queensland's frogs croaking? *Nature Australia* **25**: 56-62.
- Lemckert, Frank.** 2002. The frog with the Midas looks. *Nature Australia* **27**: 62-69.
- Mahony, M.** 1996. The decline of the Green and Golden Bell Frog *Litoria aurea* viewed in the context of declines and disappearances of other Australian frogs. *Australian Zoologist* **30**: 237-247.
- Pyke, G.H.** 1999. Green and Golden Bell Frog. *Nature Australia* **26**: 50-59.

How to Make a Wetland More Frog-friendly

Frog-unfriendly habitat	Frog-friendly habitat
Generally open environment; exposed to wind	Environment sheltered from wind
Mostly deep, open, permanent water	Some open water; depth varies; mostly shallow; some areas seasonally dry
Flowing water	Standing water; if flowing then backwaters and billabongs present
Steep or vertical banks	Gently shelving banks
Clearly discernible “clean” edges	Edges obscured by vegetation
Little or no emergent or marginal vegetation	Abundant emergent and marginal vegetation
Surrounding area with few trees; grazed, trampled, slashed, mowed, sprayed or tidied	Surrounding area supporting trees and tussocks; left undisturbed; logs, litter, rocks or old fenceposts lying about
Fish present	No fish

*Note that in Victoria you require a permit from DSE to catch tadpoles or frogs.
So the rule is: Make your environment welcoming and let the frogs find it by themselves!*
