

The disappearing frogs

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The first major review of Australian frogs was published in 1961 and listed 94 species. In the subsequent 45 years of research that figure has more than doubled. Sadly, for the past 20 years there has also been an attrition which has now become extremely serious. This phenomenon has been called "declining frog populations".

Frogs are sensitive to aquatic environmental pollution and it is mainly for this reason that their demise has attracted considerable concern. Frogs lay naked, unprotected eggs in fresh water. The eggs and tadpoles are therefore exposed to aquatic pollutants which either interferes with growth processes (thus causing abnormalities), or are so toxic that they will kill them.

The trigger for Australian awareness was the extinction of the Gastric Brooding Frog, *Rheobatrachus silus* in southeast Queensland. In 1974 it was reported to be unique in the animal kingdom in swallowing its eggs, incubating its young in its stomach, and giving birth to baby frogs through its mouth. This news attracted worldwide attention, but one winter the total population disappeared. It has not been seen for 25 years.

There is a number of threats to frog populations (see <http://www.deh.gov.au/cgi-bin/sprat/public/sprat.pl>). Habitat loss is important, and particularly the loss of breeding sites such as pools and ponds. Many species breed in ephemeral water created by a natural land depression, so that levelling for any purpose eliminates the breeding site.

Global warming and increased ultra-violet radiation have been cited frequently as causal agents, but at present there are no hard data to support these assumptions. Drought, particularly at higher altitudes has been implicated in the loss of the golden toad in Costa Rica. Collection of frogs in Asia for European restaurants was conducted on such a scale that embargoes on exports were enacted in several countries.

A recent threat is a fungal disease called chytridiomycosis (generally referred to as chytrid for short). The fungus invades the skin and, because frogs rely upon the skin for respiration, infected ones become lethargic and then die. At present there is no known cure.

The extinction of any animal or plant species is an irreversible tragedy, but the loss of frogs is particularly disturbing. The reason for this is that complex glands in frog skin secrete a wide variety of chemical compounds of benefit to human and animal medicine. These compounds include novel antibiotics, mosquito repellents, and even a glue which is being tested for its use in surgery. Much of this work is being undertaken in Australia and does not require a single frog to be killed. If frog species disappear, the opportunity to search for other new secretions will disappear as well.

Another reason for concern is the fact that frogs are providing an early warning of pollution, and it is important to take notice.

References:

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Birth of the Gastric Brooding Frog
Photo Mike Tyler