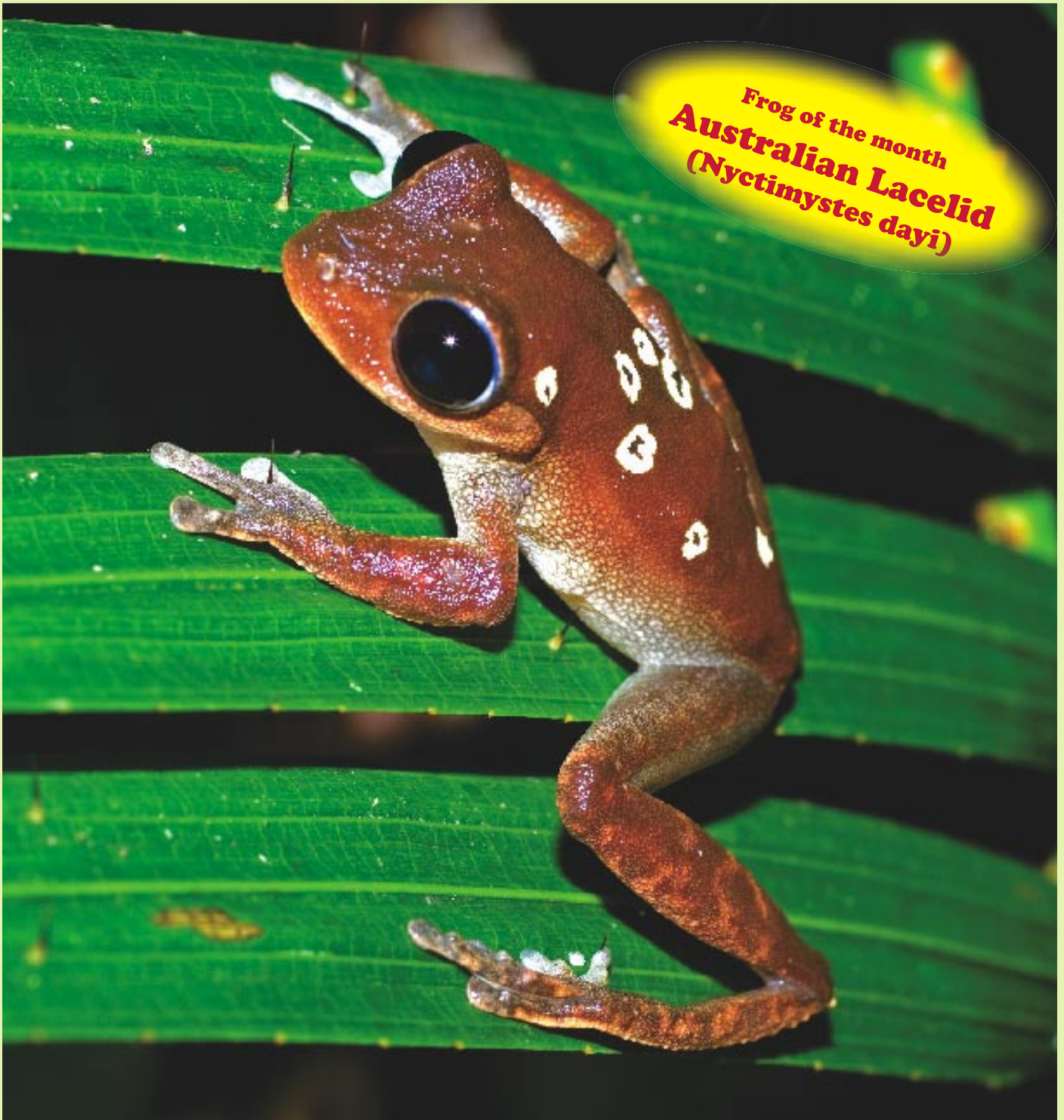




# *The Croaker*

**Newsletter of the Tablelands Frog Club**

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**December 2007**



# Tablelands Frog Club

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# Tablelands Frog Club

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### DISCLAIMER:

Opinions expressed in this Newsletter are not necessarily that of Tablelands Frog Club.

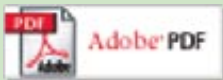
### PUBLIC INFORMATION:

The Croaker is the Newsletter of the Tablelands Frog Club Incorporated. This Newsletter is produced by the voluntary efforts of members. We gratefully accept all contributions, however limited space may mean that contributions are not included immediately, and all are subject to editorial discretion. The TFC newsletter is published bimonthly (i.e. February, April, June, August, October, & December). Newsletter submissions are due on the 15th of the preceding month. Please direct all contributions to The Editor c/o Tablelands Frog Club, at the addresses listed above.

TFC meetings/nights and field trips/outings are held monthly. See schedule for dates, speakers and locations. Annual membership fees are:

- \$15.00 Adults
- \$15.00 Family
- \$ 5.00 Junior/Associate

The Croaker is now available as a PDF to members that have access to email. The PDF version of *The Croaker* is in full colour, and contains more information than mail-out photocopied versions. Email costs less to send out, and doesn't waste paper and other resources, making it good for the Tablelands Frog Club and the environment. To take advantage of this service, contact the Tablelands Frog Club with your email details. You will need Adobe Acrobat Reader to open PDF files. The latest version of Adobe Acrobat Reader is available as a free download from:



<http://www.adobe.com/downloads/>

<http://www.tablelandfrogclub.com>

## Editorial bullrush!

Hello all and welcome to the final TFC newsletter for 2007. With the new year pending I hope everyone gets into the Christmas spirit of sharing. Further to this I hope you all continue in sharing with others in the new year. You can begin with sharing with other TFC members by contributing to the newsletter, and supporting club meetings and field trips. You will notice that this newsletter has less pages than previous ones. This is due to the lack of contributions. It seems the same people send me something to add to the newsletter. A big thanks should go to our president here. But this edition I would like to point out Shaun Cook's contribution. Shaun is ten years old. He wrote a small article on the frog of the month. Thanks Shaun, I look forward to many more articles in the future. I hope you all enjoy this issue of *The Croaker*, and I look forward to seeing something from every member next year.

My regards to all...  
Darren Green



### Front Cover

Australian Lacelid by Michael Anthony. See Page 4 for this story.

### Our Story

The Tablelands Frog Club was formed in January 1995 in Yungaburra by a group of people who were aware of diminishing numbers of frogs in all areas and who were keen to learn more about the species in general. From the outset guidance was available from experts in the field. Since that time public interest has been constant and the Club has grown rapidly. Frog enthusiasts have joined from as far afield as Adelaide in the south to Weipa in the north. The pooling of Club members' expertise in various related fields has helped the Club to become established and recognised within the community. Membership numbers reached 94 within the first year and are still increasing. On November 17, 1995, the Club became incorporated under the Queensland Associations Incorporation Act 1981. The Club now operates under appropriate rules.

### What can I do as a member?

The Club needs all the support and enthusiasm you can provide to help us to achieve a better understanding of these much overlooked animals. Some of the rare species are facing extinction at this very moment. We need assistance to address the many problems which threaten the livelihood of these vulnerable creatures by improving our knowledge of their habits and habitat, by enhancing their environment and by educating our children and the public at large on these issues.

**Education:** The Club offers many opportunities for you to learn about frogs and in turn to educate others.

**Research:** Grant applications are made by the Club as an incorporated body and research is led by social scientists who provide you with the opportunity to participate in this work. The Club maintains an information database on frog distribution and invites your input.

**Protection of frog environment and breeding:** The Club provides guidance and knowledge on how to protect and create friendly frog environments and how to set up a breeding programme for common species in your garden.

### Our Aims

**To study frogs:** The Club meets once a month with professional guest speakers and relevant videos. Members are encouraged to participate in general discussion and to introduce items of interest. A mobile library of scientific and general information on frogs is available at these meetings. Members recordings of frog distribution and animal husbandry are collated on a database for research purposes. The Club conducts workshops and field trips with professional guidance. The Croaker, the Club's newsletter, contains scientific information, contributions from both adult and junior members and general business matters of the Club.

**To conserve and encourage the preservation of frogs:** The Club has a Code of Conduct and abides by the Nature Conservation Act 1992, runs public awareness campaigns through the media, displays static educational material, encourages a 'Frog Friendly' environment and guides members on breeding programmes of common species in gardens and urban parks.

**To encourage children's interest in frogs:** The Club holds workshops suitable for junior members, runs a section called 'Kid's Corner' in the newsletter aimed at the younger group and conducts various competitions with appropriate educational prizes. The Club also guides children in frog breeding programmes and encourages them, under parental guidance, to participate in suitable field trips.



# From the president's lily pad

Welcome to the Christmas issue of The Croaker

Everything is starting to look green again, most of us in the north would have had some good rain by now. The forecast was for an early and large "wet" this year so fingers crossed!

We have had two meetings since the last newsletter.

The October meeting was held at the Mitchell Room at the Mareeba DPI. It was planned as a member's night, a chance for everyone to bring along photos of frogs to show other members and for identification. Unfortunately this meeting was poorly attended. We will try this idea again, perhaps after the wet season when there has been more frog activity. Recordings of frog calls would also be welcome, this is the best way to identify frogs. The Mitchell Room is an excellent venue and we hope to use this facility again.

The November meeting featured the Wilderness Society's Cape York presentation by Di Horsburgh. This meeting, in Yungaburra, was well attended and those who did come along were treated to quite an amazing demonstration of the importance of Cape York as a wilderness area, in fact one of the great biodiversity hotspots of the world, up there with places such as the Amazon, Serengeti and Borneo. As such the area is now earmarked for World Heritage status.

We won't have a December meeting but have a special treat in store for January. Marion Anstis has now written her second book, the Frogs and Tadpoles of Australia and will be in the far north to continue her research. She has agreed to give a presentation on the frogs and tadpoles of northern Australia. Marion is particularly interested in the rainforest microhylid frogs,

especially their eggs, so if anyone locates nests of these frogs please let the committee know.

The only field trip to take place was to Mt Fisher, the third highest peak in Queensland. Due to a combination of lack of use and the after affects of Cyclone Larry the track was very much overgrown and we had to cut our way through numerous native and introduced species of prickly vines and other vegetation for about 3 hours without getting very far. The only animal of interest was a Black Snake, curled up in the grass on a hillside, one of the few open areas along the track. We hope to return to Mt Fisher at a later date to continue our pruning activities and may even find some frogs!



With the storms happening in the dry western tablelands, many species of burrowing frog should now be emerging from their dry season torpor to breed in temporary pools and newly flowing streams. Our next field trip should hopefully locate some of these species. Take care on the roads as many of the burrowing species may look superficially like a toad. One of largest of these species, the Northern Snapping Frog *Cyclorana novahollandiae* will feature as frog of the month in our next issue.

Check the schedule of events page for dates & localities of meetings and field trips.

Merry Frogmas and a Croaky New Year!

Michael Anthony  
President TFC

<http://www.tablelandfrogclub.com>

## Schedule of events...

Dates, times & localities will be confirmed in the newsletter prior to meetings and field trips.

### Meetings...

#### Friday 18 January 2008 TBA Cairns

Marion Anstis, author of The Frogs & Tadpoles of South-eastern Australia and now the Frogs & Tadpoles of Australia, will talk on - the Frogs & Tadpoles of Northern Australia! Not to be missed.

#### Friday 15 February 2008 TBA

To be announced.

#### Friday 28 March 2008 Yungaburra

Annual General Meeting.

### Events...

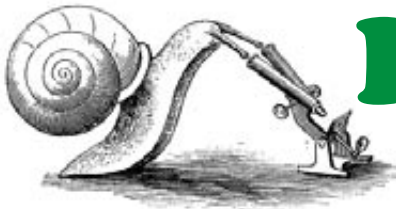
#### Field trips...

##### Saturday 15 December 2007

Mt Carbine, hopefully to coincide with early wet season storms. Meet at pub at around 7pm.

##### Saturday 9 February 2008

Mareeba Wetlands - there are 18 species of frog recorded from the Wetlands. We will meet on the corner of the Mareeba/Chillagoe Road and Spring Rd not far out of Mareeba, at 4.30 pm. Walk will start at dusk from the Fasio Rd entrance to the Wetlands.



# In the spotlight

## Australian Lacelid (*Nyctimystes dayi*)

### Details...

**Family:** Hylidae

**Common name:** Australian Lacelid; Day's Frog; Lace-eyed Tree Frog

**Scientific name:** *Nyctimystes dayi*

**Description:** This frog is orange-brown to rich brown on its back. Some individuals have a number of cream or white spots on the head, back, arms and legs. These spots sometimes have black centres. The eyes are very large and the pupils are vertical. The belly is creamy-white or yellowish and coarsely granular. The throat and the underneath of the arms and legs are black. The upper surfaces of the arms and legs have faint banding or marbling. The skin on the back is smooth or finely granular. The fingers are nearly fully webbed and the toes are fully webbed. The toe pads are often smaller than the finger pads. The heel often has a small flap of skin.

**Size:** 50 mm

**Habitat:** This frog lives in montane areas often near fast flowing rocky streams. They are often seen on rocks and plants at the side of these streams.

**Call:** This frog has two distinct calls. When calling in a group the call of the breeding male is a drawn out "eeeeeeeee" repeated three or four times in succession. The calls of solitary males are a short, sharp "ee" every five to six seconds.

**Breeding:** Occurs during spring and summer.

**Eggs:** Are large and may be laid in clumps of over 100 eggs. These clumps are laid on or under rocks, at or below the water-line.

**Tadpoles:** Are dark brown above and a sandy colour below. The head and body are flattened and the tail is very muscular. These tadpoles have suckorial mouths that allow them to attach to rocks and other surfaces in the fast flowing water.

**Similar species:** This frog can be distinguished from *Litoria eucnemis* and *Litoria genimaculata* by its unique lower eyelid and vertical pupil.

**Other characteristics:** The lower eyelid of this frog is unusually patterned with fine pigmented lines. They often look like fine gold or thick pearly veins.

### Conservation Information...

**Suspected threatening processes:** Inappropriate catchment management, including degraded water quality, and disease/pathogens (e.g. chytrid fungus, viruses).

**Population size:** An estimate of the total number of adults present in the species entire range is 5001-10000 individuals. Factors affecting population size and distribution are unknown or unsubstantiated.

**Population trend in Australia over the past 50 years:** Trend unknown but population size suspected to be decreasing.

**Knowledge of population trend in Australia:** Nation-wide monitoring, but not with statistical sensitivity.

**Population concentration:** Majority concentrates at more than 25

locations. (e.g. the number of sites in which individuals group together either seasonally, such as breeding sites, or they may occupy discrete habitat patches within the broader landscape, such as discrete water bodies or drainage units.)

**Ongoing management activities in Australia:** Management mostly related to enforcement of conservation laws.

**Reproductive potential for recovery:** The average number of eggs deposited per adult female per year is 51-200 eggs/female/year. Minimum age at which females are known or suspected to first reproduce is 2-3 years.

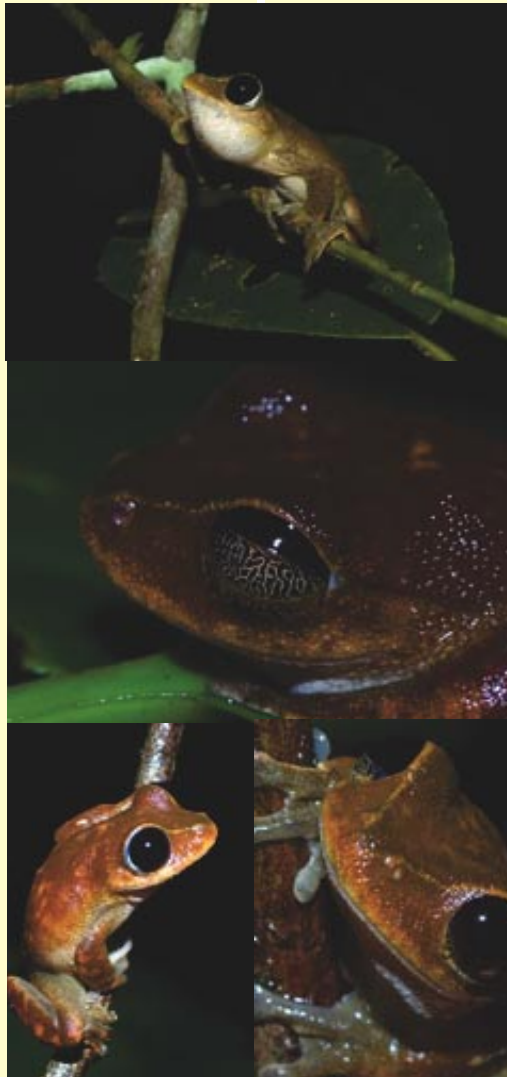
**Range size in Australia:** The size of the geographic area over which the taxon is distributed: 101-1000 km<sup>2</sup>.

**Distribution trend:** Area occupied has declined by 25-74%. (This is an estimate of change in the portion of the total range that is occupied or utilised; it may not equal the change in total range.)

**Knowledge of distribution in Australia:** Distribution is well known and occurrence can be accurately predicted throughout the range.

### Source...

Frogs Australia Network.



This beautiful tree frog can be found in two colour forms. You would usually find them in a rich tawny brown. The other way you will find them is when the rosette like white marks which are scattered on their back. *Nyctimystes* lay their eggs in clumps of around 100 attached to the under surface of rocks, mostly in fast flowing streams. Their eyes are very large with a dark brown iris. The lower eye lid is seen best when the frog adopts a cryptic posture in which the membrane is drawn up over the eye, this is where it gets its name the lace lid. Their fingers have lateral skin and the fingers are most or partly webbed.

The tadpoles take a minimum of 3-4 months to complete their development, but those from spawn laid in late summer may remain as tadpoles until the following summer.

The *nyctimystes* call is an "eeeeeeeee" sound and can be heard from a long way away. Its habitat is next to fast flowing streams with rainforests around them. The other way to recognize these frogs is by their big wide eyes they have. Another way to recognize them is by the brown colour and how they sit on their habitat.

So that is a brief description of the *Nyctimystes dayi*. As you can see there are lots of weird things about frogs and how they live and really enjoy finding these frogs. I even do a frog monitoring activity with Michael Anthony at Crystal Cascades. It is really fun seeing all the different frogs and other animals.

AUTHOR: Shaun Cook (age 10).

PHOTOS: Michael Anthony.

February "in the spotlight" focuses on the Eastern Snapping Frog (*Cyclorana novahollandiae*)





# Amphibian news...

## Frogs: Mythology & folklore

It is somewhat surprising that the frog is so important to Mythology and Folklore. Being an amphibian that transforms it is a symbol for birth, death and rebirth. Frogs have held an important role in the mythologies of many civilizations. Most of these myths center around the frog's transformation from a tadpole to a frog. Many cultures saw this as a rebirth thus associating them with creation myths and the land of the dead. The fact that some frogs can lay up to 3,000 eggs makes it no wonder that they have been associated with many fertility deities and creation itself.

In Egypt the frog is most commonly found associated with the goddess Heqet (or Heket) who was the goddess of fertility and childbirth. Sometimes depicted as a frog or a woman with a frog head Heqet was seen as protectress of childbirth. Her priestesses who were trained midwives wore amulets that bore her image. It is theorized that the reason why the Egyptians saw frogs as being a symbol for childbirth and creation was because during certain times of the year thousands of frogs would surface from the Nile River. Thus creating the belief that this was an omen of fruitfulness. In the Greco-Roman tradition the frog was a symbol of Aphrodite and Venus, along with fertility the frog came to represent harmony between lovers.

The frog is seen in creation myths to Hindus. In the Rig Veda the Great Frog supports the universe and is representative of the matter from which all is created. In Vedic traditions frogs are seen as deities that chant by croaking for rain in a time of drought.

The frog held important roles in western mythology as well. In early Christian myth the frog symbolized resurrection and a higher stage of spiritual awakening. As well European folklore states that it is good luck to have a frog show up in your home and if heard outdoors it signified coming rain.

As much as the frog has been a symbol for life and birth it has also been a symbol for death. Another European myth held that it was bad luck to kill a frog for they housed the souls of dead children. In the ancient Zoroastrian religion of the Middle East the frog was associated with the deity or anti-creator Ahriman (who is the most evil of all beings). It wasn't until Europe's Medieval times that the frog was given such an unfavorable rap in the common culture. It was during this period that the frog went from a sacred symbol of creation and death to being seen as evil. The frog along with a handful of other animals was seen as being a witch's familiar also known as devoted magical animal thus attaching the negative stigma that they have on them today.

AUTHOR: Diana Tierney, 14 November 2006.

SOURCE: <http://folktalesmyths.suite101.com/article.cfm/frogs>

## Parasites might spur evolution of strange amphibian breeding habits

Parasites can decimate amphibian populations, but one University of Georgia researcher believes they might also play a role in spurring the evolution of new and sometimes bizarre breeding strategies.

Brian Todd, a researcher at the UGA Odum School of Ecology Savannah River Ecology Lab, explains that most amphibians start their lives in water (tadpoles are a good example), and then make their way onto land as adults and return to the water to breed. But there are other breeding strategies as well. Take, for instance, the Darwin's frog, the species that swallows its eggs and, a few weeks later, regurgitates its young. Or the marsupial frog, a species that carries its eggs on its back until they hatch.



Several species lay eggs in small puddles on land or high up in trees where they hatch as miniature versions of adults, bypassing the larval stage entirely.

Researchers have hypothesized that natural selection favored these non-traditional breeding strategies as a way to avoid predatory fish or the risk of a breeding pond or stream drying up. In a review article published in the November issue of *The American Naturalist*, Todd argues that the diversity of reproductive strategies that amphibians employ might also

be influenced by the benefits that come from avoiding viruses, fungi and other parasites. "Most parasites known to affect amphibians tend to be aquatic, so there are clearly benefits to using non-traditional breeding strategies," Todd said.

He points out that breeding in ponds or streams tends to concentrate amphibians in the same place at the same time, which increases the transmission of parasites. The process of metamorphosis decreases an amphibian's immunity, which is another factor that benefits parasites at the expense of their amphibian hosts. Todd said that the idea that parasites can influence reproductive strategies can be tested. A disease caused by a chytrid fungus is causing rapid declines in amphibian populations in Central and South America, and researchers can examine the populations over time to see if species with non-traditional breeding habits are less affected. Scientists could also compare the burden of parasites on traditional and non-traditional breeders.

Of course, there are benefits to breeding in the water – most importantly that there is plenty of food. But Todd said that when the death rate from parasites – or any other aquatic threats – exceeds the benefits that come with rapid growth, natural selection begins to favor strategies that shorten or eliminate the aquatic life cycle phase altogether.

"The role of parasites has been overlooked until now," Todd said. "I want to highlight the idea that they might be important to evolution so that people can begin studying amphibians in a new light."

SOURCE: ScienceDaily 15 November 2007

## Tools for Amphibian & Reptile Conservation

Registration for the 2008 SEPARC Annual Meeting is now open!, 21-24 February 2008, The University of Georgia/Athens, GA. The Warnell School of Forestry and Natural Resources is proud to host the 2008 SEPARC Annual Meeting. Events for the 2008 meeting are organized around the theme "tools for amphibian and reptile conservation", and will include an organized symposium covering land use and management, habitat protection, coastal conservation, relocations and headstarting, emerging infectious diseases, tools for monitoring and inventory, and outreach. The 2008 meeting will also offer a range of workshops on land acquisition and management for conservation, web tools for inventory and monitoring, detection and diagnosis of diseases, estimating species detection for assessing and planning wildlife inventories and research, and how to be effective at outreach. To continue to promote the importance of research and participation by graduate students and other professionals, there will be a poster presentation and social. All participants are encouraged to submit abstracts and present their work at the meeting. The 2008 meeting will also feature Sunday field trips to The Jones Center at Ichauway, Savannah River Ecology Lab, Pigeon Mountain, and Ft. Stewart. Finally, no trip to the classic city is complete without some soul food, so all 2008 meeting registrations will include a ticket to the SEPARC Soul Food Banquet. For more information, registration costs, deadlines, etc go to the separc website page [www.separc.uga.edu](http://www.separc.uga.edu)

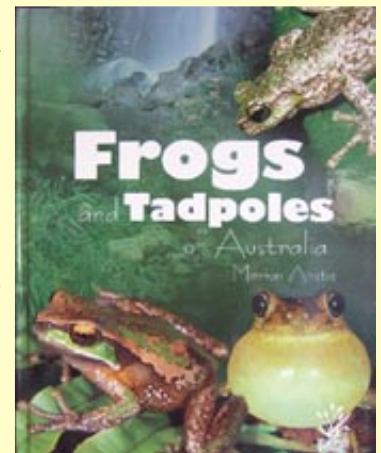
## Frogs & Tadpoles of Australia

From Marion Anstis, the author of *Tadpoles of South-eastern Australia*, comes this new book, one of the New Holland Young Reed series on Australian wildlife.

*Frogs & Tadpoles of Australia* takes us into the private world of frogs and tadpoles and how they live and breed in many different habitats across Australia.

Hard cover, 48 pages in full colour design enough to whet anyone's appetite, and there are even activities to do at the end! Attractively priced at \$19.95

it is available from the author (email: [frogpole@tpg.com.au](mailto:frogpole@tpg.com.au)), or can be ordered through bookshops (ISBN: 9781921073076).





# Amphibian news...

## Frog inspires new super glue

INSPIRED by the toe pads of tree frogs and crickets, researchers in India have created a form of sticky coating that is both strong and reusable. When conventional adhesive tape is pulled off a surface, cracks form on the tape, which also picks up dust and other particles, quickly losing its stickiness. Writing in the journal *Science*, the researchers described how the toe pads of tree frogs contain "microscopic channel patterns" that stop cracks from forming. "Toe pads have patterns on the surface, it's not a smooth layer. Underneath these patterns, there are fluid vessels, glands and blood vessels," said Animangsu Ghatak, an assistant professor at the Indian Institute of Technology in Kanpur. "Sticky tape gets contaminated with dust and you only use it once or twice. But lizards and toads use their toes all the time. They don't get contaminated and they create very strong adhesion. We are trying to mimic that by creating this material." Prof Ghatak and his colleagues added tiny fluid vessels in their model adhesive and found they increased adhesion by 30 times. "These fluid vessels, because of the capillary pressure, the adhesion stress increased by 30 times," Prof Ghatak said. The team hopes to use their technology on stickers for utensils and food so that they may be peeled off cleanly, and on other adhesive devices that are meant to be reused. "One application is for stickers on utensils, fruit, where you want to remove them cleanly, you don't want the adhesive to remain on them, which is annoying," he said.

SOURCE: Daily Telegraph 12 October 2007.

## Deformed frogs on the hop

THE growing number of deformed frogs in recent years is caused at least partly by runoff from farming and ranching, new research indicates. Nitrogen and phosphorous in the runoff fuel a cycle that results in a parasitic infection of tadpoles, resulting in loss of legs, extra legs or other deformities, according to researchers led by Pieter Johnson of the University of Colorado, Boulder. Their findings are being published in this week's online edition of *Proceedings of the National Academy of Sciences*. The deformed frogs have been a puzzle for more than a decade, since a group of schoolchildren in the upper Midwestern state of Minnesota discovered a pond where more than half of the leopard frogs had missing or extra limbs. Suggested causes have ranged from pesticides and increased ultraviolet radiation to parasitic infection. While parasite infection is now recognized as a major cause of such deformities, the environmental factors responsible for increases in parasite abundance had largely remained a mystery, Johnson said in a statement.

Here is how the cycle works: The parasites, called trematodes, have a series of host species. They grow in snails and become infectious when released by the snails into ponds, where they can infect frog tadpoles, forming cysts in the developing limbs. Water birds eat the frogs and then excrete the parasites back into the ecosystem where they can infect the snails, he explained. The increasing amount of runoff is fueling a boom in algae growth, the snails eat the algae and also undergo a population explosion, increasing the breeding places for the trematodes. To test the idea, the researchers built 36 artificial ponds in central Wisconsin and introduced snails. Ponds with added runoff had a 50 percent increase in the snail population compared with those that did not have the extra nutrients. The research was funded by the National Science Foundation.

SOURCE: Daily Telegraph 25 September 2007.

## Lizards & salamanders use lungs to hear

Science Daily — COLUMBUS, Ohio - Certain species of salamanders and lizards can actually hear through their lungs, according to a new study at Ohio State University. The research extends previous studies showing that some types of earless frogs and toads use their lungs to pick up sound vibrations, said Thomas Hetherington, an associate professor of Evolution, Ecology and Organismal Biology at Ohio State. The results of the current study suggest lung-based hearing may exist in a variety of land-based animals. "This primitive system of hearing may have been the auditory system for the first animals that lived on land,"

Hetherington said. "And it appears that it may still be important for some species today, particularly ones that lack middle ears."

Hetherington examined four species of salamanders and three species of lizards to determine if the lungs might play a role in their hearing. Although salamanders lack middle and external ears,

both groups of animals have inner ears that can process sound. In his studies, Hetherington found that sound causes the animal's chest to vibrate, and the vibrations are carried by air from the lungs to the animal's inner ear where it is processed as sound. The experiments make clear the importance of the lungs for hearing - one species of salamander that lacked lungs did not show the chest vibrations that the others did. And when the lungs of the other species were filled with oxygenated saline instead of air, the animals' chests no longer showed vibrations. The study was published in a recent issue of the *Journal of Comparative Physiology A: Sensory, Neural and Behavioral Physiology*.

Hetherington put the animals on a table in a soundproof chamber. He bounced a beam of laser light off of each animal's skin to measure the skin's movement when exposed to various sound frequencies emitted from a speaker inside the chamber. Low frequencies caused the greatest vibrations: peak motion ranged from 1,600 to 2,500 hertz in small newts (newts are a type of salamander); from 1,250 to 1,600 Hz in larger salamanders; and from 1,000 to 2,000 Hz in lizards. Lizards have middle ears, which is where the eardrum is located, and the skin covering this area of the animal's head vibrated at slightly higher frequencies of about 2,000 to 3,000 Hz. The lungless salamanders didn't respond at any frequency.

To determine how dependent the animals were on their lungs for hearing, Hetherington filled the lungs of three red-spotted newts and three green anoles (an anole is a tropical lizard that can change color) with oxygenated saline solution - the oxygen in the solution allowed the animals to keep breathing. Sure enough, the response to sound - the vibrations - dropped. "It practically disappeared," he said. "While sound may get in through other routes, the lungs are clearly the most sensitive to sound waves," Hetherington said. After filling the lungs with the saline solution, the vibrations noticeably decreased by about 90 percent in all of the animals. The animals' sensitivity to sound was restored when the lungs were emptied and filled again with air. While Hetherington knew from his previous research that certain frog species depended on their lungs to conduct sound, he wasn't sure before these studies that the same process held true in other amphibians and small reptiles, whose lungs are covered with ribs and muscle. "Using the lungs to detect sound seems to be especially useful for small animals with really small lungs," Hetherington said. "Thinner body walls respond more readily to sound, so it may be that the lungs can capture a wide range of frequencies only in small animals."

SOURCE : Science Daily 7 March 2007.

## Underestimation of frog numbers causes concern

Frogs are vanishing from all the world's ecosystems with unprecedented speed. It is thought that more than 100 species have died out since 1980 alone. In a recent paper, a team of experts, including researchers from the University of Canterbury, says the number of species has been strongly underestimated and they are calling for action. The researchers from France and New Zealand collected and collated more than 500 DNA sequences, including 60 previously recognised species, occurring in the Guiana Shield, which harbours the largest continuous tract of virgin tropical rainforest. This region of Amazonia comprises French Guiana, Suriname, Guyana, eastern Venezuela and northern Brazil. PhD researcher Antoine Fouquet says the samples revealed an astonishing level of cryptic diversity, with the number of species identified potentially two-fold greater than previously thought. Antoine says such underestimation of amphibian diversity has broad implications for the management of biodiversity, and particularly that of many Neotropical amphibians which are considered highly threatened. He says frogs are the "canaries in the coal mine" and their current decline is regarded as an indicator of the environmental crisis. "Given the unique evolutionary history of the Guiana Shield region, and its nearly pristine condition, it is critical that there is greater understanding of its frog species."

SOURCE: ScienceDaily 2 November 2007.

## Note from the Editor

The Croaker is your Newsletter. If you have any feedback, comments or additions, please forward them to the TFC (see page 2 for address). If you have anything interesting, perhaps good or sad news, then perhaps we could all learn from it. Don't let anything be forgotten, send it in for others to read. Remember, we all have different knowledge and experiences, let's share it so that we all may benefit.







# Amphibian news...

## Understanding endangered frog's diet & environment may save it

A brightly coloured tropical frog under threat of extinction is the focus of a new research project hoping to better understand how environment and diet influence its development and behaviour. Biologists from The University of Manchester have teamed up with experts at Chester Zoo in the hope that their findings will not only help save the splendid leaf frog *Cruziohyla calcarifer* from extinction in the wild but provide clues as to how it can be better catered for in zoos and aquariums.



Loss of habitat in its native Costa Rican rainforest, combined with global declines in amphibian populations generally through a combination of environmental change and disease, have all contributed to the splendid leaf frog's precarious situation.

"This research aims to contribute to our understanding of the basic factors that influence the development and survival of these frogs,"

said Dr Richard Preziosi, a lecturer in the University's Faculty of Life Sciences, who is supervising the project. "For instance, with the exception of certain mammals, we know surprisingly little about what animals should be eating. And yet the diet of splendid leaf frogs affects their colouration which, in turn, determines their mating behaviour. "The global decline in amphibian

populations means research such as this, carried out ex situ, is therefore critical for both conservation projects in the wild and for maintaining and successfully breeding the frogs in zoos and aquariums."

The research at Chester Zoo is being complemented by field studies being conducted by Dr Preziosi and Manchester Museum's Curator of Herpetology, Andrew Gray, in the Costa Rican jungle. "The combination of our fieldwork and the project at Chester Zoo will provide us with a much better idea of the nutritional requirements of this species," said Dr Preziosi. "In the wild these animals live in the tree canopy of the rainforest and are exposed to sunlight for long periods of time, so this study will also examine the effect that ultraviolet rays have on the fitness and viability of captive-bred frogs."

Nearly a third of the world's 6,000 amphibian species are threatened with extinction and more than 120 species have already vanished from the planet. Across the globe, conservation organisations and professionals are mobilising efforts to help save as many of these species as possible. As part of the response, a new organisation known as the Amphibian Ark (AArk) has been set up to help other conservation organisations assist in the effort. Kevin Buley, Head of Zoo Programmes at Chester, said: "This study will help benefit the conservation breeding of amphibians in European zoos and aquariums. "As such, it will also help to save many critically endangered species from extinction as part of the global amphibian ark initiative."

SOURCE: Science Daily 29 October 2007.

## Frog decline linked to climate shift

An abrupt, unprecedented climate shift apparently associated with global warming appears to have caused the mysterious disappearance of 20 frog species in Costa Rica, researchers reported yesterday.

The frog declines, which included the infamous extinction of the Golden Toad, coincided with a sudden reduction in moisture levels on the continental divide atop Monteverde in Costa Rica's central highlands, according to J. Alan Pounds, of the University of Miami, and his colleagues.

The discovery is evidence that global warming is affecting wildlife in previously unrecognized ways, he said. "Biological communities are

responding to climate change more quickly than we thought," he said. "We've observed a pattern here and our responsibility is to sound an alarm."

Monteverde was settled in the 1950s by Quakers from the United States who set aside a large area of "cloud forest" as a nature preserve. Moisture-laden winds off the Caribbean cool as they rise up the eastern slope, forming a cloud bank on the mountaintop and shrouding the jungle in mist.

The cloud forest is home to an enormous diversity of plants and animals dependent on its extreme moisture levels. Conversely, other species adapted to drier, warmer conditions live further down the mountainside, below the base of the cloud.

Pounds and his collaborators, Michael P.L. Fogden and John H. Campbell, discovered that amphibians and reptiles living at upper elevations had simultaneously suffered severe population reductions. At the same time, a number of bird species from lower sections of the mountain began an upward migration. Toucans, previously found only in the lowlands, now live side by side with the Resplendent Quetzal, the colorful, long-tailed bird identified with the cloud forest going back to pre-Columbian times.

All of these changes coincided with unusually warm, dry conditions produced by a combination of the El Nino weather pattern and a more general, long-term rise in sea surface temperatures, the researchers found. These effects, Pounds said, are amplified at higher altitudes and have caused the base of the cloud bank to lift. As the cloud recedes up the mountain, the misting and condensation essential to life have decreased.

When the scientists examined stream flow and ocean temperature data, plus daily records of air temperature and mist frequency near the continental divide, they discovered not only that the dry season had become warmer and drier, but that dry days now come in longer sustained runs.

The overall climate trend corresponds to a shift in bird demographics that has brought 15 new species up from lower elevations. Meanwhile, two lizards found only at higher elevations began to decline in the late 1980s and had vanished by 1996. In the same period, a third species of the small lizard that thrives in drier conditions remained stable. All of this took place against the backdrop of a massive frog population decline that began in 1987 and has since wiped out 40 percent of species present in a series of synchronous crashes that have occurred during peaks of warm and dry conditions.

Unlike birds, earthbound amphibians have limited upward mobility. The Golden Toad, which lived only in several wetlands in a small area almost at the mountaintop, had nowhere to go. It was last seen in 1989.

Global warming probably was not the immediate cause of the Golden Toad's demise, Pounds said. More likely the climate fluctuation weakened the animals and made them vulnerable to an epidemic involving a pathogen or parasite, such as the chytrid fungus implicated last year in other frog die-offs around the world. But Pounds said no one will ever know the exact cause.

"At the time of the crash we weren't aware of what was happening," Pounds said. "Nobody looked at the animals to see what killed them."

Pounds's research, published in today's issue of the journal Nature, appears to confirm the warnings of many scientists that amphibians are reacting to widespread environmental degradation in even seemingly pristine habitats.

"This is very important," said Andrew Blaustein, a biologist at Oregon State University. "It's a convincing scenario for why the Golden Toad and other species went down the tubes. It also shows how incredibly complex these environmental interactions can be."

Michael Lannoo, U.S. coordinator of the Declining Amphibian Populations Task Force, said Pounds has demonstrated the first animal extinction attributable to modern climate change. "People who say global warming won't be a problem argue that animals will simply shift to more suitable habitats as change occurs," he said. "Alan's results show there are limits to that."

AUTHOR: William Souder. SOURCE: The Washington Post 15 April 1999, Page A03. AVAILABLE: <http://www.washingtonpost.com/wp-srv/inatl/longterm/climate/topnews.htm>

## Frogs in groups

We All know that a group of fish is called a school, a group of wolves is called a pack and a group of cows is called a herd of cattle but do you know what a group of frogs are it is called... Turn to page 12 for the answer.



# Amphibian news...

## Genetic analysis finds greater threat in frog-killing fungus

A deadly fungus that has decimated populations of mountain yellow-legged frogs in the Sierra Nevada can likely be spread by sexual reproduction, seriously complicating efforts to save the frogs from extinction, according to a new genetic analysis led by researchers at the University of California, Berkeley. The dramatic decline of the mountain yellow-legged frog over the past several decades has been attributed to the introduction of non-native predatory fish in some areas and to chytridiomycosis, a quickly spreading disease caused by this waterborne fungus, *Batrachochytrium dendrobatidis*. The study, to appear in the journal *Proceedings of the National Academy of Sciences*, suggests that the frog-killing fungus may end up playing the bigger role in the frog's demise because of the pathogen's ability to spread over long distances and possibly persist in the environment as a consequence of sexual

reproduction, according to the researchers.

"This group of fungi, when it reproduces sexually, can create spores that can last for a decade," said John Taylor, UC Berkeley professor of plant and microbial biology and principal investigator of the study. "That could make this pathogen a harder problem to defeat. As a resistant spore, the fungus could be transported by animals, including humans or birds, or lay dormant in an infected area until a new host comes along." Biologists are still determining exactly how this fungus, first identified in 1998, kills the amphibians it infects, but most believe that the pathogen disrupts the frogs' ability to absorb water through its skin.

In the western United States, the fungus has been spreading quickly, moving west to east across the Sierra Nevada at a pace of about a mile per year, according to the researchers. Tens of thousands of mountain yellow-legged frogs in hundreds of sites have virtually disappeared in the wake of the pathogen's emergence in the area. The researchers set out to determine which of two competing hypotheses for the origin of chytridiomycosis was more plausible. If the fungus was recently introduced to an area, the researchers would expect to find a single genotype that had spread by clonal reproduction. If, however, the fungus is endemic to a region, they would expect to find diverse genotypes resulting from a long history of association that provides enough time for isolates to diverge through mutation and genetic recombination. If the fungus is endemic to a region, the animals in the area would normally be resistant to its destructive effects because they would have co-evolved together. However, biologists theorize that changes to the environment - from global warming to pollution from agricultural chemicals - could make native frog populations susceptible to a pathogen with which they've previously co-existed.

According to the study, neither epidemic spread nor endemism alone explains the decline of these frogs. "We found sites dominated by a single fungal genotype, which suggests a recent spread of the pathogen through clonal reproduction," said lead author Jess Morgan, who was a UC Berkeley post-doctoral researcher working with Taylor at the time the study was conducted. "But this study also provides the first evidence of genetic recombination in *B. dendrobatidis*, which results in multiple, related genotypes and signals that sexual reproduction is occurring." The findings could help explain the global spread of this pathogen, which has also been found in South America, Australia, Europe and Africa, said the researchers. While human-assisted spread is possible, the fungus has infected amphibians in pristine areas too remote for human activity. "Up until now, people thought the movement of this pathogen was mainly via infected frogs, so such measures as restrictions on the pet trade were put in place," said Morgan, who is now a research scientist at the Department of Primary Industries and Fisheries in Queensland, Australia. "If, in fact, this fungus produces resistant spores, people could be unwittingly transferring this pathogen around the world from dirt on our shoes or car tires. But spores could also hitchhike on the feathers of birds for quick transport across mountain ranges." Moreover, if resistant spores remain in lakes where previous populations of frogs have succumbed to chytridiomycosis, attempts to repopulate the lakes with healthy frogs will likely fail.

Study co-authors Roland Knapp, ecologist at UC Santa Barbara's Sierra Nevada Aquatic Research Laboratory, and Vance Vredenburg, a post-doctoral scholar in integrative biology at UC Berkeley, have led a number of such efforts to reintroduce mountain yellow-legged frogs in remote lakes in the Sequoia and Kings Canyon national parks and the John Muir Wilderness. The sites were areas where previous frog populations had been wiped out by chytridiomycosis. Out of 10 reintroduction attempts over the past four years, seven have failed, the authors said. "Within two years, the healthy frogs we introduced would become infected with the fungus and die," said Knapp. "It's a stunning thing to see. One year, there is no obvious evidence of the disease, the next year, we'd come back to see hundreds of dead or dying frogs, and then the following year, they'd all be gone." Although genetic testing should be able to detect the spores, scientists do not know where to look for them. In addition, blindly testing environmental samples has thus far failed to yield evidence of the spores.



Infected frogs can be treated with fungicides to remove the pathogen, but researchers say it is not a practical long-term solution since they would remain susceptible to re-infection if returned to the same lake. To conduct the study, researchers collected two species of mountain yellow-legged frogs from six sites in the Sierra Nevada. *Rana sierrae* is found in northern Sierra Nevada and represented in the study by frogs at the sites at Little Indian Valley, Summit Meadow and Mono Pass, while *Rana muscosa* is found in southern Sierra Nevada, where study sites Laurel Lake, Hitchcock Lakes and Woods Lake are located. The sites at Mono Pass and Summit Meadow are both easily accessible to humans

by Tioga Pass Road, a popular thoroughfare in Yosemite National Park. Accessing the other four sites, however, was decidedly more difficult, necessitating hikes of two to three days or, on several occasions, the use of helicopters. The researchers cultured the fungi samples obtained from the 100 frogs collected and had the pathogen's genome sequenced by the U.S. Department of Energy's Joint Genome Institute in Walnut Creek, Calif. They compared genetic markers for the Sierra Nevada *B. dendrobatidis* samples with fungi collected from other regions around the world.

"The genotypes of our fungi in the Sierra are not that different from genotypes found around the world," said Taylor. "That means there must be someplace else on earth where this fungus is endemic. One would guess that the frogs living where the ancestral population of this fungus is located would not be affected that badly. We could then try to determine the mechanisms those frogs use to resist the pathogen." The study also found that the sites near Tioga Pass Road contained two similar populations of fungi. Because the lakes are 40 kilometers apart, the evidence is strong that movement of the fungi between the two locations was somehow assisted by humans, said the researchers. "If we confirm that spores are a factor, then there may be precautions we can take to contain their spread," said Morgan. "This could involve cleaning shoes before moving from one infected site to another. Some fungi produce spores during certain times of the year. If that is the case with this fungus, we could consider restricting public access to infected sites during those times."

As the U.S. Fish and Wildlife Service considers listing the mountain yellow-legged frog as an endangered species, biologists are racing to find ways to staunch the spread of the frog-killing fungus. "This frog used to be the most abundant amphibian, and perhaps the most abundant vertebrate, in the whole Sierra Nevada," said Knapp. "Over the past 30 years, it has disappeared from up to 95 percent of its historic range, and its absence is impacting other organisms. Garter snakes that used to prey on these frogs are now declining. The frog's decline is leading to an unraveling of a high-elevation ecosystem." The study was part of a larger project on chytridiomycosis and the mountain yellow-legged frog led by co-author Cheryl Briggs, UC Berkeley associate professor of integrative biology. The study was supported by the National Institutes of Health (NIH) as part of the National Science Foundation/NIH Ecology of Infectious Diseases program.

SOURCE: Science Daily 11 August 2007.

PHOTO: Shown are mountain yellow-legged frogs at Kings Canyon National Park that have not been infected by the deadly fungus, *B. dendrobatidis*. (Credit: Vance T. Vredenburg).





# Amphibian news...

## Ecology of Chytridiomycosis in Rainforest Stream Frog Assemblages of Tropical Queensland

In the wet tropics of Queensland, Australia, eight species of stream-dwelling frogs have experienced population declines. Some declines were associated with an emerging infectious disease of amphibians (chytridiomycosis) caused by the fungus *Batrachochytrium dendrobatidis*. The authors examined the spatial and temporal pattern of infection prevalence in a sample of frog populations. Infected adults and tadpoles of all

species were found, and infections occurred at every site. Infection prevalence varied among species and was always < 10.0% in adults but ranged from 0.75 to 76.0% in tadpoles. In this system tadpoles and adults of some species may act as disease reservoirs, experiencing avirulent infections, whereas other hosts (declining species) experience virulent infections. Infection prevalence was higher during the cool, dry winter season (May to September) and at high elevations (600–800 m), suggesting regulation by environmental conditions, including temperature and precipitation. The authors found no relationships between infection prevalence and mean body condition, fluctuating asymmetry of hind limbs, population density, or the presence of metamorphosing tadpoles and juvenile frogs. Although it is not certain whether chytridiomycosis was responsible for past frog population declines in the wet tropics of Queensland, the pathogen is now endemic. The researcher's data indicate that at the landscape level, environmental conditions have strong effects on host-pathogen dynamics. These effects interact with species-specific behaviour or immune function and may be important underlying determinants of chytridiomycosis epizootics and emergence.

SOURCE: Woodhams, D.C. & Alford, R.A. (2005) Ecology of Chytridiomycosis in Rainforest Stream Frog Assemblages of Tropical Queensland, *Conservation Biology* 19(5):1449–1459.

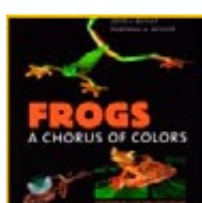
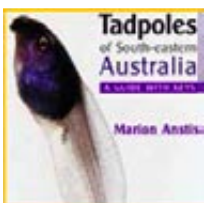
## Life History of an Endangered Amphibian Challenges the Declining Species Paradigm

Declining species of vertebrates, including amphibians, have a life history that is characterised by low fecundity, long time to maturity, limited capacity to disperse and habitat specialisation. However, by studying aspects of the life history of an endangered amphibian in south-eastern Australia the authors show that a paradox may exist for some declining amphibians. They used standard mark–recapture methods over two breeding seasons (2000–01) to study a population of the green and golden bell frog (*Litoria aurea*) on Kooragang Island, New South Wales, with the aim of determining its age structure, and the growth and survival rates of individuals. Two age classes for males and three for females were derived using von Bertalanffy growth models. Around a quarter of the male and female marked population was a first-year cohort. The male and female age structures appeared to be stable over the two breeding seasons. However, there were fewer female *L. aurea* in the <12-month age class and more in the >24-month age class in 2001, which may indicate that recruitment declined in the study area. A short time to maturity (~3 months) was recorded for males. The maximum-likelihood estimate of survival for males in the 2000 breeding season was relatively high (0.76), although the capture probability was low (0.19). The biology of *L. aurea* conforms to an 'r'-strategist, which is characteristic of a colonising or 'weed-like' species and not of one that has become extinct over much of its former range.

SOURCE: Hamer, A.J. & Mahony, M.J. (2007) Life History of an Endangered Amphibian Challenges the Declining Species Paradigm, *Australian Journal of Zoology* 55:79–88.

**The February edition of The Croaker will focus on the Eastern Snapping Frog (*Cyclorana novahollandiae*). Send in your stories, anecdotes, scientific data, literature reviews, observations, etc., to the Editor, c/o TFC at the address on page 2.**

## Christmas book ideas...





# Toad news...

## Toads on march to the south

THE nation's cane toad plague could engulf Melbourne, western Tasmania, Perth and the outskirts of Adelaide, according to the latest government projections of the pests' relentless spread. Despite spending more than 25 years trying to halt the slow but relentless march of the poisonous amphibians, cane toads continue to spread from Queensland across the country at about 30km a year. The federal Government's State of the Environment report yesterday revealed projections of the cane toads' potential distribution that include coastal regions across southeast and southwest Australia, as well as across the tropics and even as far south as parts of Tasmania. "The distribution of cane toads in Australia is expanding, and bio-climatic analyses suggest they could eventually spread over most coastal areas," the report says.

Associate Professor Bob Beeton said the Department of Environment and Heritage had revised the potential range of the cane toads after monitoring their spread to date, which revealed they had considerable capacity to adapt to new environments. "They have already made it to ... some places which have surprised us," he said. In NSW, cane toads have been reported as far south as Coffs Harbour, and their pace of migration can be rapidly accelerated. A dead cane toad was found last year in a container of bananas unloaded in Perth, creating friction between the West Australian Government and the Queensland banana growers. The West Australian Government has trained dogs to sniff out toads crossing the border in the Kimberly, where the pests are heading west at a rate of 40km to 60km a year.

Dr Beeton said the impact of climate change on the spread of cane toads south was unclear. Warmer temperatures made the south more conducive to the toads, but a dryer climate was expected to hinder their progress. Researchers at the University of NSW announced last month that the endangered tiger quoll had not only survived the cane toad plague, but had started to reclaim their former territories by either learning to avoid the toads or becoming resistant to their poison.

AUTHOR: Matthew Warren.

SOURCE: The Australian 16 December 2006.

Available <http://www.theaustralian.news.com.au>

## Cane toads prefer to mate on the quiet

MALE cane toads are more attracted to louder mating calls than their female counterparts, but each sex prefers the other to be quieter, a 14-month study has found. A James Cook University study into trapping cane toads found that using recordings of the pest's mating calls at the right volume was three times more effective than normal trapping techniques. Researchers Lin Schwarzkopf and Ross Alford compared the use of the recordings with traditional trapping techniques, which include using insects to lure the toads. Their report, published in the CSIRO's Wildlife Research journal, said that trapping programs could utilise mating calls for greater success. "Existing cane toad trap designs use lights to lure insects into to traps, and toads enter the traps to feed," the researchers said in the article. "Using a large, outdoor experiment arena and playback of cane toad mating calls, we examined the possibility that cane toads... are attracted to mating vocalisations. "We found that both male and female toads were attracted to quiet playbacks, whereas only males responded to loud playbacks." The report said that number of toads trapped using the recording was triple the amount captured without the mating calls. But the authors also said that the number of toads trapped during the study was quite low. "Although the traps did catch toads, the number trapped compared with toad abundance in the area was small... (with) only 87 toads (captured) in 292 trap nights."

AUTHOR: Mark Schliebs.

SOURCE: The Australian 28 September 2007.

Available <http://www.theaustralian.news.com.au>

## Cane-Toad movie download

The Cane-Toad movie is about an Aussie yobbo cane toad who learns the dangers of being one of the less adored icons of the Aussie landscape. The award winning computer animated Cane-Toad is a short film by Andrew Silke and David Clayton. In November 2001 the two animators took 5 months off their day jobs to create their own short film. Cane-Toad was made with the 3d software Maya in 2002. The full version of Canetoad is now online for your viewing pleasure. Go to <http://www.cane-toad.com/>



# TFC Members...



Wai Awaarau  
Mandy Lindsay  
Bevan Pritchard  
Dr Stacey Gelis  
Dr Amber Gillett  
Dr Che Phillips  
Robyn King  
Dominic Chaplin  
Val Bonner  
Bonnie Arbon  
Judy Catchpole  
Keith Martin  
Cindy Harkness  
Jo Loader  
Kia Bailey  
John Booy  
Grant Turner  
Kent Jozefowski  
Clarissa Morris  
Sue Morris  
Beryl Davidson  
Inga Lorenz

Atherton  
Atherton  
Atherton  
Beerwah  
Beerwah  
Beerwah  
Broadbeach  
Bungalow  
Burrows Oxley  
Caboolture  
Chambers Flat  
Clifton Beach  
Edge Hill  
Glass House Mountains  
Glass House Mountains  
Gordonvale  
Innisfail  
Kallangur  
Landsborough  
Landsborough  
Malanda  
Malanda

Merv Robson  
J & M Sweetzer  
Marney Fichera  
Michael & Sharon Williams  
Cheryl Lammeretz  
Tricia Schilling  
Ian Wilesmith  
Murray Wellington  
Darren & Jo Green  
Michael Anthony  
Shaun Cook  
Maria Destro  
Eleanor Duignan  
Alan Gillanders  
Murray Powdren  
Margret Egger  
Sian Moore & Scott Radcliffe  
Neville Simpson  
Claudine Grandjean  
Chris Tsilemanis

Malanda  
Malanda  
Mooroobool  
Newport VIC  
Peachester  
Reesville  
Redbank Plains  
Speewah  
Trinity Beach  
Whitfield  
Whitfield  
Whitfield  
Whitfield  
Yungaburra  
Yorkeys Knob  
Yungaburra  
Yungaburra  
Yungaburra  
Yungaburra





# Kids corner...

## Hop on the Kermit bandwagon

ROAD signs of a flipper-waving Kermit the Frog attract thousands of visitors annually through the flatlands of the Mississippi Delta to the home town of the famous amphibian and his equally renowned creator, Jim Henson. The city of Leland (population 5500) was where Henson lived from 1936 to '48. His childhood home was torn down years before he became famous. But a permanent exhibit about Kermit called Birthplace Of The Frog: An Exhibit Of Jim Henson's Delta Boyhood, was created here after Henson's death in 1990. The exhibit was a gift to Leland from the Jim Henson Company. Kermit, the original Muppet, sprang from Henson's childhood and memories of playing along nearby Deer Creek with childhood friend Theodore Kermit Scott, who is believed to be the inspiration for the frog's name. "My wife says my smile looks just like the frog," said Scott, now a 70-year-old retired philosophy professor who lives in Monroe, Virginia. Scott said that, as children, he and Henson used to play at Deer Creek and catch frogs. The Kermit exhibit, in a three-room building along the banks of Deer Creek, features childhood photos of Henson and an actual Kermit puppet, with his banjo, sitting in a swamp-like setting.

"Everyone seems to know the work of Jim Henson and it just appeals to them," said Ashley Zepponi, the exhibit's director. "Most people are charmed by it." Visitors from around the world are routinely among the 10,000 people who find their way here each year, Zepponi said. Leland lies about 13km east of the Mississippi River and Greenville, where Henson was born, and it is only a short 2.4km from US61, otherwise known as Mississippi's Blues Highway. Connor Ahearn, 26, and his brother Sean, 24, stopped over while on a cross-country road trip from Raymond, New Hampshire. A book of roadside attractions tipped them off to the exhibit. "We both liked the Muppets growing up," Connor Ahearn said, while looking at a photo of the original Kermit puppet, sitting alongside his more modern counterpart. Not many differences exist, except for original Kermit's more lizard-like appearance and paler skin tone.

The main room features the Swamp Kermit scene from the original Muppet Movie, a gift from the Jim Henson Foundation, enclosed in a glass case, and a viewing area showcasing episodes of The Muppet Show and other Henson works. Recent



additions to the exhibit are several puppets from Henson's The Song Of The Cloud Forest, a segment from one of his TV shows, about the importance of preserving South American rain forests and habitat. The brightly-coloured frogs and alligators are on loan from the Jim Henson Foundation. Visitors can pause for a quick photo-op with an oversized stuffed Kermit, propped in front of a rainbow scene, and then wander into a Muppet memorabilia room, which features hundreds of donated items. "It's just amazing the people who come in and they are all a part of it," said Zepponi.

Two shelves of Muppet items, including a plush Animal doll, were provided by San Diego resident Kevin Watson. "He contacted us to let us know that he absolutely had to have a part of his collection be a part of this exhibit," Zepponi said. Zepponi said visitors often send items by mail. The items on display include McDonald's Happy Meal toys, plush Kermit and Miss Piggy dolls, and vintage Muppet lunch boxes. There is also a special case devoted to Muppet Babies and Sesame Street. Dorothy Dixon, 18, of Leland, grew up with Sesame Street and the Muppets. Her favourite movie was Muppets From Space. For the true Muppets fanatic, the exhibit also has a gift shop with hand-puppets, T-shirts and all things Kermit – the top seller, of course, being "anything with Kermit on it," said Emily Kearney, a tour guide at the exhibit.

Kermit made his debut in a 1955 television comedy called Sam And Friends. The first puppet was fashioned from an old coat belonging to Henson's mother. Henson and his 60-centimetre tall puppet joined Sesame Street in 1969. The Muppet Show followed in 1976 and ended its run in 1982. Henson's puppets moved to the big screen in 1979 with The Muppet Movie, followed by hit movies including The Great Muppet Capers and The Muppets Take Manhattan. Henson gave Kermit a voice and a life for 35 years. After Henson's sudden death at age 53 from pneumonia and a strep infection, Kermit's voice and movements were done by Steve Whitmire, who started working for Henson in 1978. Whitmire was a Kermit fan from the time he was a child – just like most of the people who stop by the exhibit in Leland.

AUTHOR: Kathy Hanrahan.

SOURCE: The Sunday Telegraph 16 August 2007.

## Froggy jokes

**Q. Why are frogs so happy?**

**A. They eat whatever bugs them!**

Q. What does a frog wear on St. Patrick's day?

A. Nothing!

**Q. What did the frog dress up for on Halloween?**

**A. A prince.**

Q. How many frogs does it take to screw in a light bulb?

A. One frog and 37 light bulbs, slippery hands, ya know.

**Q. What's the preferred car of frogs?**

**A. The Beetle.**

Q. What's green and jumps?

A. A frog!!

**Q. What's green and red?**

**A. A very mad frog.**

Q. What's green with red spots?

A. A frog with the chicken pox!

**Q. What's green with bumps?**

**A. A frog with the measles!**

Q. What's black and white and green?

A. A frog sitting on a newspaper.

**Q. What's green and dangerous?**

**A. A frog with a hand-grenade.**

Q. What's white on the outside, and green on the inside?

A. A frog sandwich!

**Q. What do you say to a hitch-hiking frog?**

**A. Hop in!**

Q. What happens when two frogs collide?

A. They get tongue tied!

**Q. What kind of shoes do frogs wear?**

**A. Open toad!**

Q. What do frogs do with paper?

A. Rip-it!

**Q. What is the first book a tadpole reads?**

**A. Metamorphosis by Kafka.**

Q. How does a frog feel when he has a broken leg?

A. Unhappy.

**Q. What happens when you mix a frog with a bathtub scrubby-mit?**

**A. A rabbit!**

Q. Why did the frog read Sherlock Holmes?

A. He liked a good croak and dagger.

**Q. What happened to the frog's car when his parking meter expired?**

**A. It got toad!!**

Q. What do you call a frog that crosses the road, jumps in a puddle, and crosses the road again?

A. A dirty double-crosser!

**Q. What's green green green green green?**

**A. A frog rolling down a hill**

Q. What is a frog's favorite time?

A. Leap Year!

**Q. Why did the frog go to the mall?**

**A. Because he wanted to go hopping.**

SOURCE: Various websites.



# Pond croakings

Like most fields of scientific endeavour, herpetology (the study of reptiles and amphibians) involves a certain amount of jargon. In this section I will attempt to explain the terms they use. I will provide other definitions as required in forthcoming newsletters. Over time you will be able to build up a dictionary of common terms.

### BASKING

A term used to describe a herp's behaviour when positioned in the sun. Thermoregulation may or may not be occurring.

### BRUMATION

An inactive period during the colder months of the year, a term to describe hibernation in reptiles.

### CREPUSCULAR

Active at the transition between day and night, dusk or dawn, twilight hours.

### DIURNAL

Primarily active during daylight hours.

### ECTOTHERMIC

Regulation of body temperature by means of an external heat source.

### LENTIC

Adapted to living in still pools or slow-moving water. Lentic tadpoles have an oval body, mouth at the front of the head, and deep fins.

### LOTIC

Adapted to living in fast-flowing streams. Lotic tadpoles have a flattened body, a sucker-like mouth on the underside of the head, and narrow fins.

### NOCTURNAL

Active at night.

### THERMOREGULATION

Control of body temperature.

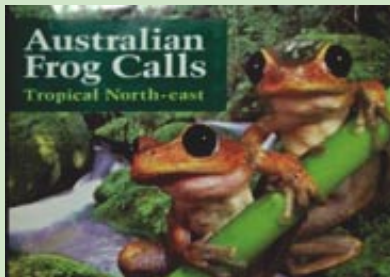


### Frogs in groups

We All know that a group of fish is called a school, a group of wolves is called a pack and a group of cows is called a herd of cattle but do you know what a group of frogs are it is called... The answer is an army of frogs.



## TFC Merchandise



Frog calls CD \$25.00

Visors	\$20.00
Frog Calls Wet Tropics (Tape)	\$10.00
Attracting Frogs to Your Garden	\$20.00

**Order now!**



Caps \$20.00 each



Tee shirts \$15.00 each



Polo shirts \$10.00 each



Polo shirts \$10.00 each





# Tablelands Frog Club

Mail Bag 71

YUNGABURRA QLD 4879

## Application for Membership

\$15.00 Adult membership
  **Membership type**
 \$15.00 Family membership
  \$5.00 Junior/Associate

Surname(s): \_\_\_\_\_ Given name(s): \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_ P/Code

Postal: \_\_\_\_\_

\_\_\_\_\_ P/Code

Phone (h) \_\_\_\_\_ (w) \_\_\_\_\_ (m) \_\_\_\_\_

E-mail Address (for newsletters and updates) \_\_\_\_\_

Occupation: \_\_\_\_\_

The Tablelands Frog Club Incorporated is incorporated under the Associations Incorporation Act.

### TFC OFFICE USE ONLY

Membership paid: \$ \_\_\_\_\_ Paid by:  Cash,  Money Order,  Cheque

Receipt number: # \_\_\_\_\_ Date issued: \_\_\_\_/\_\_\_\_/\_\_\_\_

Membership number: # \_\_\_\_\_ Date entered: \_\_\_\_/\_\_\_\_/\_\_\_\_



### Tablelands Frog Club

Mail Bag 71

YUNGABURRA QLD 4879

### MEMBERSHIP TAX RECEIPT

Membership paid: \$ \_\_\_\_\_ Paid by:  Cash,  Money Order,  Cheque

Receipt number: # \_\_\_\_\_ Date issued: \_\_\_\_/\_\_\_\_/\_\_\_\_

Membership number: # \_\_\_\_\_ Signed: \_\_\_\_\_

Please Post Membership Application to: Mail Bag 71, Yungaburra QLD 4872



# *The Croaker*

**Newsletter of Tablelands Frog Club  
December 2007**

Sender...

**Tablelands Frog Club  
Mail Bag 71  
YUNGABURRA QLD 4879**

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Please deliver to...

**The  
Croaker!**



**Read it!  
Read it!**

**<http://www.tablelandfrogclub.com>**