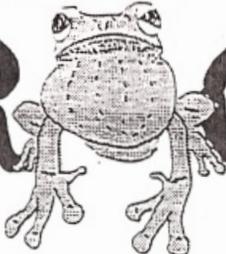


FROG CALL



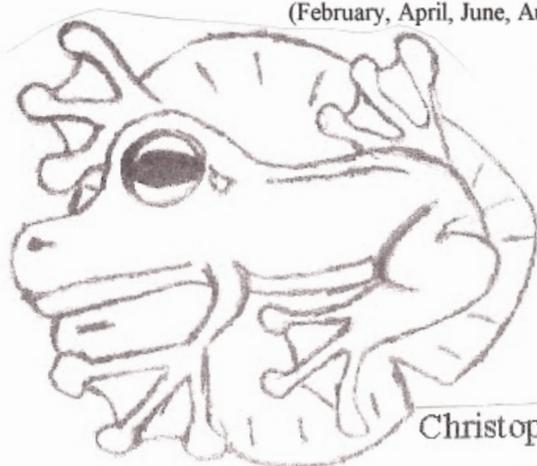
THE FROG AND TADPOLE
STUDY GROUP OF NSW INC.

NUMBER 46 - March 2000
PO Box A2405
Sydney South NSW 1235

THE NEXT MEETING: 7 PM, FRIDAY 7th April 2000
for a 7.30 pm start at the AUSTRALIAN MUSEUM (WILLIAM ST ENTRANCE)

Meetings are held on the first Friday of every even month
(February, April, June, August, Oct. and Dec.).

2000/2001 membership fees will rise by \$5.
This the first rise in 5 years.



Green Tree Frog

Christopher Spiteri

MEETING FORMAT for 7th April 2000

- 7.30pm Guest speaker: Stan Orchard
"Education and attitudes to frogs".
- Animal Hospital, Channel 9 TV Crew
will be our guests at this April's meeting.
- 8:15pm 5 favourite frog slides or 5 minutes
- 8:40pm Guessing competition and Auction
- 9:00pm Finish for tea, coffee & biscuits

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At our last meeting Trent Penman spoke about his honours thesis entitled "Natural Factors Affecting the Early Life Stages of the Green and Golden Bell Frog". While the title sounds like a mouthful, Trent looked at the effects of pH, temperature and salinity on the eggs and tadpoles.

It turned out that the Green and Golden Bell Frog babies are just as tough as the adults. The tolerances to pH, temperature and salinity are relatively broad. It is likely that these qualities allow the species to turn up (and survive) in some of the most unlikely frog habitats.

For conservation, the study supported the notion that the decline of the Green and Golden Bell Frog is related to the loss of ephemeral habitats. The change in habitats suited some other species, at the expense of the Green and Golden Bell Frog.

Other items discussed or presented at the meeting were the Cane Toad Alert, the rationalisation of common names for frogs, salinity issues, Green and Golden Bell frogs at Kogarah golf course. Frank Lemckert showed great slides including the female tussock frog from Dorigo (now extinct), the green thighed frog from Buladela, *Litoria Lesuri*, a metamorph barred frog, and giant burrowing frog. Other slides were presented by Arthur White. These included the Booralong Frog from Tweed River. Congratulations to Martyn Robinson, Melissa Medo and Renee Trass for winning the guessing competition.

Danie Ondinea brought in 4 more native species of frog plant (or suspected frog plant) which grow in and around Sydney's wetlands.

Tall Sedge (*Carex appressa*) and Knobby Club-Rush (*Isolepis nodosa*) are attractive hardy sedges which provide shelter for small frogs when planted in clumps. They are also attractive to insects such as butterflies and native bees.

Native Pennywort (*Hydrocotyle peduncularis*) a delightful hardy groundcover, and Common Reed (*Phragmites australis*) a tall handsome grass which provides important bird and insect habitat, are not known as frog plants (yet!), but we're keen for your feedback about how your frogs take to them.

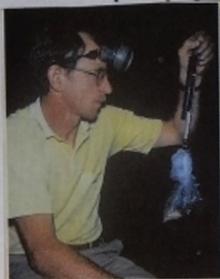
There will be more frog plants for your pond and bog garden available for sale at the April meeting.

For further information about the frog plant service, contact Danie Ondinea on (02) 9569 5447 (ph/fax).

These plants all come from Randwick Community Nursery. If people would like to detail with the Nursery direct, they are open Monday to Friday 9.00 am to 3.00 pm. They are a wholesale nursery situated in Kingsford and can be contacted on (02) 9399 0933.

Thanks to Trent Penman and Danie Ondinea for the information to add to our newsletter MW.

The Annual General Meeting of the Frog and Tadpole Study Group will be held on Friday the 2nd June 2000 at 7.30pm. Nomination forms are available from Arthur White, or write to our Post Office address and will be available at the April meeting. Anybody interested in nominating for any positions are greatly encouraged to do so as the committee is always short at least a couple of people. MW



Newcastle University's Dr Michael Mahony.

The Rare Stuttering Frog has resurfaced in the Watagan Mountains and Canada Drop Down Creek in Ourimbah State Forest near Palmdale - and frog experts are puzzled by its comeback.

They are out to find out why the frog (*Mixophyes balbus*) has reappeared in the area after disappearing since the mid 1980s.

This medium sized brown frog has been seen near Gap Creek, in the Watagans, by a student, working under Newcastle University frog expert,

Dr Michael Mahony, State Forests herpetologist Frank Lemckert, said other sightings have been made at Muirs Lookout and at Narara Creek.

Known for its distinctive call, which sounds like someone stuttering (Err...Err...Err), the frog is present in only a few sites in NSW.

However, the southern end of Wyong Shire is rich in frog life with more than 20 amphibian species present, Dr Mahony said, "and in frog population terms, this is an immense diversity".

The elusive stuttering frog is a survivor, first evolving in Australia as long ago as 50 million years and is able to be detected by mimicking its call.

The female frog is mute, the only sound she utters, being a small squeak when she is in trouble or when a male frog tries to mate her when she's not in the mood.

Dr Mahony and his colleagues could not find any evidence of the species between Sydney and Taree five years ago.

Now, the tiny strongholds in the Watagans, Central Coast and Myall River area are being closely watched.

Researchers have inserted minute electronic chips under the animals' skins to monitor movements, while State Forests' staff have been briefed on the animals' characteristics.

Footnote: Dr Mahony said frogs are unique indicators of environmental quality because their eggs and tadpoles rely on clean water and the adults have moist skin which is sensitive to change in the terrestrial habitats.

Story courtesy of State Forests magazine



The Rare Stuttering Frog

A news publication of Wyong Shire

Shire Wide

FATS APPEAL

Here's an appeal to our members that costs nothing:

1. Find the leaflet in this newsletter. The one with our Helpline's telephone number and which says what the Frog Rescue and the Cane Toad Alert does.
2. If you can, run off a few copies of it.
3. Hang the leaflet(s) up somewhere or give it out - wherever you think frogs or frog-friendly folk might turn up: library, supermarket, vegie shop, your local paper. French restaurants might prove interesting.
4. If all fails, laminate it and stick it on your car. Hoot if you see another one! L.V.

TADS APPEAL

And here's an appeal that positively pays you:

The FATS Group's Foster Frog project is up and running! And you could join in. It's fun, it's good, you might learn something and you get involved.

It all started on 22 January, when Samantha and Paul Longman got their White-lipped Tree Frogs to spawn a few thousand eggs, and when the FATS Group then got most of them. Sandra Johnston's White-lips spawned one month later, resulting in her donation to FATS of another huge lot of baby tads.

This great blessing has three immediate repercussions:

1. All ye on the hopelessly long waiting list - There will be bags of 6 baby frogs, already starting at the next meeting. Read the article below!
2. There are also other species coming on stream, although in smaller numbers. Read the bit further down.
3. The FATS Group is still looking for a few more FROG FOSTERERS. Here's why: Samantha and Sandra distributed their tads to as many experienced people as they could to space them out a bit. (Well, quite a bit, really. To raise 6000 tadpoles successfully, you need ideally 6 cubic metres of heated and well-filtered water. They don't grow well if crowded or if the water goes a bit off.) So we placed many of Samantha's batch with Martyn Robinson, Robert Browne, David Nelson, Arthur White and me. Many of Sandra's spawning went on loan to Paul Speirs, Steve Weir, Marion Anstis, Monica Wangmann and me, and to four of the helpful staff at Kellyville Pets. More went to other aquarium-experienced people who responded to calls in the ANGFA and Aquarium Society's newsletters. Effie Howe and Greg Howe, John Buckley, and Jess Drake and Julian Corbet came to the fore. In case you'd also like to be in on this, read on.

If you feel you know how to keep tadpoles (or tropical fish) and have a spare tank (3' or larger), we need your help right now in raising some of these White-lips for the FATS Group. The *Litoria infrafrenata* tads are quite colourful and fast, and the froglets are gorgeous. The duration of your involvement would be 2 - 5 months.

Here's the deal: The FATS Group lends you about 150 young tads for every 100 litres of heated and biofiltered water that you can set aside, and FATS pays for their food. They metamorphose over the next 1-4 months (depending on crowding factor, water quality and temperature). You then transfer those that are ready into a frog tank with flyscreened lid, e.g. a large plastic tank with clip-on lid and with drain hole in the bottom. If need be, we can lend you one or two. FATS then pays for fly pupae for up to 9 weeks - I will get them delivered to your house (and any spare ones you can give to your own frogs or fish). You then return the young frogs to FATS, but if you take out a licence (\$40 for 2 years) you can keep six of them for yourself. As always, telephone support is available.

Please ring Lothar on 9371 9129 or 0419 249 728 if interested.

Now, the other species:

We have donations - gratefully received - of small numbers of the following:

- > Spotted Grass Frog (*Limnodynastes tasmaniensis*) tadpoles, bred by Australian Reptile Park.
- > Baby Red-eyed Green Tree Frogs (*Litoria chloris*), bred by Steve Weir.
- > Great Barred River Frog (*Mixophyes fasciolatus*), bred by Australian Reptile Park. These will be available as young frogs at the August meeting, against firm bookings and a Class 2 (\$50 p.a.) licence.

Please remember that none of the above animals must ever be released, not in your garden, not anywhere else. They don't belong around here; their parents may be from unknown or from different locations. They are for the terrariums of our members.

If you want frogs for your garden, for the Sydney area, we can fix you up with a bag of local Striped Marsh Frog tads. You won't even need a licence for that. But it's even better if you just let them come and find your pond. (For one thing, if your neighbours are light sleepers they won't be able to hold YOU responsible.)

By the way, if you want Striped Marsh Frog tads for captive keeping and breeding (and they are the most obliging breeders of them all), I'm happy to transfer some from my licence to you.

The FATS Group would like to see the following donations to make ends meet for its Foster Frog and Frog Rescue programs:

6 baby White-lips	\$25 (max. 12)
1 young Red-eyed	\$25 (max. 3)
1 young Great Barred	\$25 (max. 3, Class 2 lic.)
10 Spotted Grass tads	\$10 (max. 10)
bag of Striped Marsh tads	\$ 5 (for garden or licence)
Large quarantined frog	\$25 (Green Tree or Wh'lip)
Medium quar. frog	\$15 (Dainty or Peron's Tree)
Small quar. frog	\$ 5 (Red/Desert Tree Frog)

There are also low-priced supplies at the meetings: plastic raising tanks (L and XL size), taddy food, benzalkonium chloride, pond fish etc. L.V.



12. 3. 2000

Major FATS Group activities

Endangered Frog Survey:

A study of the habitats, status and conservation of 25 species of "at risk" frogs in NSW. Partly funded through the National Estate Grant Program

Frogweek:

First full week every November. Many activities take place to focus public attention and interest in endangered frogs. We encourage much public involvement.

Frogmobile:

A demonstration trailer, sponsored by Osram Aust., to support the FATS Group's environmental exhibitions.

Frogwatch Helpline:

0419 249 728

Cane Toad Alert:

0419 249 728

Frog Rescue Service:

0419 249 728

Web site:

members.xoom.com/frog_group

To all who are interested in helping frogs and their habitats

0419 249 728

This is the combined number for three community services provided by the FATS Group:

Frog Rescue Service

Frogs found in areas where they don't belong
Frogs found in unsafe places, injured frogs
Frog quarantine and care facilities

Cane Toad Alert

Frequent hitchhikers to Sydney area
Often in building supplies and nursery pot plants
Identification and humane destruction service

Frogwatch Helpline

Info on frogs, frog surveys and identification, frog keeping, frog ponds, water quality, habitat rehabilitation
Frog decline and frog diseases alert
Assistance to schools, community groups and media

0419 249 728

Visitors are welcome to our informative and practical meetings. They are held on the first Friday of every even month at 7:30 pm in the Australian Museum in Sydney. Our publications include the bimonthly newsletter Frogcall and the Frogfacts information sheets.



THE CANE TOADS ARE COMING

It was Sunday, and it was as noisy at the zoo as ever. Above the din, the NSW Environment Minister, Bob Debus, struggled to make himself heard. Wedged between a pram and an ABC TV camera, flanked by his staff, bystanders and wanderers, The Telegraph, Taronga's Director Guy Cooper and Serpentaria staff, he had come to announce a worthwhile community Cane Toad initiative: In areas where they have not yet taken a foothold, go and get them, have them identified and do them in humanely. NPWS officers will come and take them away, if need be.

There was praise by the Minister for the work of the FATS Group's Cane Toad Alert project. This project of Arthur's, now in its fourth year, clocks up an annual harvest of about 50 hitchhiker toads in the Sydney area. The Minister's aim was to invite the community to participate fully, and he hoped that similar projects would start up at Port Macquarie (where they are breeding!) and of course at the North Coast wherever they are not yet too entrenched.

To mark the occasion, the Serpentaria had taken some pretty frog cages out into the open, together with various dreaded Cane Toads as camera fodder. NPWS also had a display table and a stack of their new leaflets: "Cane Toads in NSW". You will see a copy of it slipped in this issue.

The leaflet, after mentioning all the sensible things, exhorts the public to "humanely and safely dispose of any identified cane toads". That subject being a hot potato with the welfare lobby, NPWS are at this stage somewhat disinclined to offer more specific advice. Spraying with Dettol or Toadex is commonly used, or – if you only have a few or a few dozen to dispose of thoughtfully, the first-the-fridge-then-the-freezer method. RSPCA, as I learned, disagree and advocate first-fridge-then-hit-on-head-with-hammer. Me being the queasy type, I'd be violently sick long before I got through the first bucketful of toads! (And I'd be plastered with their poison goo.) All this fine tuning can of course be agreed upon, perhaps best after the first few truckloads have been delivered at RSPCA's doorstep.

But what can be done where the toad is already established and breeding? Sadly, nobody knows and nobody is looking into it because all funding on Cane Toad control research was cut off 5 years ago. Culling is ineffective; it just appears to make space for more of them – a Cane Toad's worst competitor, to keep it in check, is another Cane Toad – and boy can they do saturation breeding including in the vast areas where no human ever sets foot. Is there a disease after all that is (and remains) specific to them? Can they be immunised against their sperm? Can Striped Marsh Frogs exclude them in Sydney? Can controlled burnoffs deprive their young (whose food supply is mostly termites and ants, we think) of a living? Can a series of dry La Nifla summers, or of frosty winters, wind them back again if we mop up in some other way at the same time? Can we identify strategic places they must not reach? (an inland route south via the Murray-Darling, certain drought refugia, the Brick Pit?) Which native species have suffered to what extent from the Cane Toad, and how can this be addressed in any action plans? What would it take to finally declare it a noxious pest? The research wish list

could go on and on. If we ever get tired of being the study group for frogs and tadpoles ...

Alas, at Taronga the Minister confirmed to the media that no research funding on Cane Toad control was necessary because we already know that they are coming. He may have meant that in the context of the community initiative he was announcing, but that was all the TV news reported from him (and the radio stations then picked up and ran with).

Oh well, if you can't beat them – keep them.

L.V.



THE WAITING LIST

To all those members who are still on the waiting list for a rescued and quarantined frog from before the December meeting: Please ring me to reconfirm and/or to change your species preference (Lothar 9371 9129). In many cases I will then also be able to tell you when you get your frog. Members who joined the list in December or later: You can also ring if you want to change your preference.

This request is in part because of the influx of new species (see the article above) and in part because a large sediment of members on the older part of the list don't seem to be turning up at meetings. I read out name after name from the top of the list, but only all the bottom folk were there at the last meeting. And for the 7th April meeting, especially with a Channel 9 camera crew around (who may not all be wearing crash helmets), may I ask to be mobbed in a somewhat orderly fashion? L.V.

OBITUARY

At last year's April meeting, we were addressed by Osram Australia's Managing Director, Klaus Engelhard. He spoke of Osram's desire to be associated with an environmental cause and with the FATS Group in particular. He also announced to the meeting Osram's sponsorship of a Frogmobile trailer for FATS.

Most of you met Klaus only on that one occasion, but it was an occasion you will surely remember. We had just come back from the Easter Show, we were enthusiastic, we had a Channel 9 camera crew at that meeting, and we had Osram's Managing Director saying kind words about us.

At the end of January Klaus passed away after a long illness. Our sympathy goes out to all his family. L.V.

Hopping mad

Noisy frogs send family packing

by MALISSA MILLIGAN

HOUSE extensions, fence lines and overhanging tree branches are the usual fodder of neighbourhood disputes but in North Balgowlah, war has been waged over a trumpeting chorus of frogs.

And the frogs have won.

Sleep-deprived neighbours yesterday were planning to move out of their home of less than two months because they say they can no longer cope with the noise.

The Jordan family moved into their brand new townhouse, built on a previously undeveloped site that once had a creek feeding through it, in Clontarf St about four weeks before Christmas.

A few days after moving in they paid a visit to their neighbour Heather McGlynn, complaining that the noise coming from her backyard was keeping them awake at night.

"They asked what the noise was and I said it was frogs in my fish pond," Mrs McGlynn said.

The neighbours said their son would be prepared to catch the frogs and release them at Manly Dam but Mrs McGlynn refused.

"I said I don't own the frogs they are part of the native wildlife and I couldn't stop them from coming here," Mrs McGlynn said.

"I know it takes a little while to get used to the frogs making the noise they do but you get used to it. People should be happy to have some wildlife still around."

The impasse over the



'I said I couldn't stop the frogs coming here . . . Heather McGlynn at her fish pond

frog situation resulted in the Jordans' solicitor writing to Mrs McGlynn warning that unless the frogs were removed they would take Supreme Court action.

"I couldn't believe this was happening. I am very upset but I am not going to be bullied," she said. "It's an environment issue. If people can go around and do this sort of thing we wouldn't have any wildlife left."

The National Parks and Wildlife Service has verified that her property is naturally inhabited by striped grass frogs and as a protected species, they shouldn't be removed.

Burt Jordan, a real estate agent, said yesterday

his family was now seriously considering moving out of their home which they may either sell or rent.

"Those frogs wouldn't be there but for the ponds, which are man-made, they would be hopping around everywhere and in not such concentrated numbers," he said.

"People don't realise how loud it is. It's like the Sydney Symphony Orchestra but it's not as pleasant to hear and it goes all night."

Mr Jordan said his son and wife had health problems and tried to keep the noise at bay by keeping windows shut and wearing earplugs, to no avail.

Mr Jordan said his fam-

ily were not anti-environment and had just planted 500 trees on their country property.

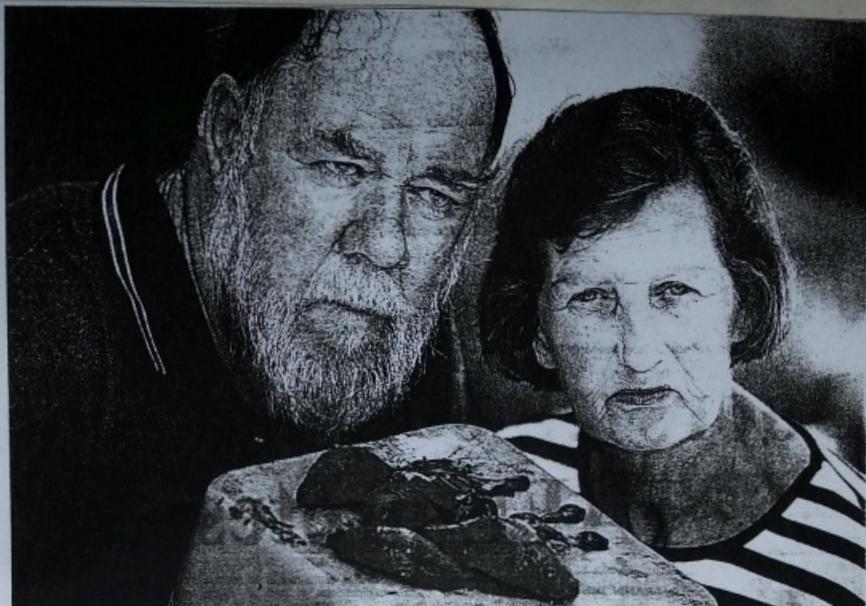
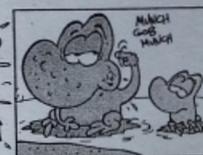
"But there has to be a balance. These frogs are taking precedence over human beings," he said.

"If there was going to be so much concern over the frogs then the council shouldn't have zoned the land for residential development in the first place. I am just a victim in this. It's cost me half a million dollars and the frogs are in charge."

Mr Jordan said he would not pursue the matter in court.

SWAMP

by Gary Clark



Poisoned pond? ... Heather McGlynn and Warringah acting Mayor Phil Coleman survey dead fish and tadpoles

PHOTO: Ros Cannio

Frogs silenced

by DANIELLE TEUTSCH

NORTH Balgowlah resident Heather McGlynn went out to her fish pond on Thursday evening to find all the goldfish dead, floating belly-up among the reeds.

She suspects the goldfish were innocent victims of foul play, with the real target being a colony of frogs that have become unpopular because of their night-time chorus.

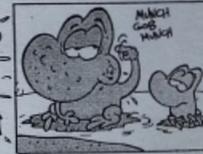
However the hardy amphibians seem oblivious to the war

February 20, 2000

THE SUNDAY TELEGRAPH www.news.com.au



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THE MANLY DAILY, Saturday, January 15, 2000

Water tested for traces of poison

being waged over their calls, which have a clicking-like sound, similar to the noise of a tennis ball being hit by a racquet.

That night there was at least one continuing its chorus, alive and kicking.

"These frogs are pretty tough," Mrs McGlynn said.

However there were remains of partially formed frogs float-

ing dead in the pond, along with the goldfish.

Mrs McGlynn said it seemed obvious something was put in the water, as there was a strong smell of bleach.

"Everybody thinks it's an attempt to kill the frogs, but we can't prove it," she said.

"I can't believe it's got this nasty."

The National Parks and

Wildlife Service has verified that Mrs McGlynn's property is naturally inhabited by striped marsh frogs and that as a protected species, should not be removed.

A NPWS spokesman said there were stiff fines of up to \$3300 or six months in jail for convicted offenders who harmed native wildlife.

Warringah Council acting Mayor Phil Colman said there

was a definite ammonia smell when he inspected the pond.

He is taking water samples to the council for testing.

Mr Colman said that if it was found that the water in the pond had been tampered with the perpetrator had committed an offence that carried a heavy fine. If the purpose was to get rid of the wildlife, the battle had not been won as the pond was on a natural watercourse.

"Once all trace of contamination is removed from the pond, the frogs will just move back in," he said.

HERPDIGEST

TURNING BIAS IN TADPOLES

After surfacing to breathe air, most tadpoles descend by turning sharply to the left or right. We have used this behavior to examine whether tadpoles of two anuran species have innate turning biases, i.e., a handedness.

Rana catesbeiana (bullfrog) tadpoles showed an overall bias to turn to the left, although there was variation in the intensity of this handedness among populations.

This is the first documentation of behavioral laterality in an anuran larva.

Xenopus laevis (clawed frog) larvae, on the other hand, showed no bias, turning equally often to the right and the left.

This phylogenetic difference is consistent with the fact that ranid tadpoles, including *R. catesbeiana*, are externally asymmetric, whereas pipid tadpoles, including *X. laevis*, are not.

Ranid tadpoles have a single sinistral spiracle through which water that enters the mouth is expelled from the body. Pipid tadpoles, in contrast, have dual symmetrical spiracles, one on each side of their body.

A functional/adaptive explanation is offered for why *Rana* tadpoles, with their left-sided spiracle, should turn to the left after surfacing to breathe air.

However, it is also possible that the handedness in spiracle position and turning are not functionally linked. This issue can be resolved by examining tadpole turning bias in anuran families whose larvae have a single, midline spiracle. From the *Journal of Herpetology*: Vol. 33, No. 4, pp. 543-548. T by Richard J. Wassersug, Department of Anatomy and Neurobiology, Dalhousie Uni, Halifax, Nova Scotia.

THE RISE AND FALL OF A POPULATION OF HYLEA BOANS: REPRODUCTION IN A NEOTROPICAL GLADIATOR FROG

A population of *Hyla boans* was studied in central Amazonian rainforest during 15 years.

The species differs from other intensively-studied gladiator frogs, *Hyla rosenbergi* and *Hyla faber*, in that males reach larger sizes than females, most reproduction is in the dry season, males call mainly from trees and rarely from nest basins, and most nest basins have aquatic connections to streams.

Many adults (15% of females, 21% of males) were captured over more than one breeding season, and some were captured over five breeding seasons.

Sizes of juveniles, and growth of one individual, indicate that males require at least two years between hatching and entering the breeding population.

Daily calling was bimodal, with peaks after dusk and before dawn. Rainfall reduced calling activity during the peak of the breeding season.

The population at the site declined to zero density after nine years of study and the site still had not been recolonized six years later.

The exponential rate of decline of the population (0.58) was more than three times the exponential rate of increase (0.15) at the beginning of the study. *Journal of Herpetology*: Vol. 33, No. 4, pp. 647-656.

LINK BETWEEN DEFORMED FROGS AND PARASITES GROWS STRONGER

Philadelphia--As scientists labor to unmask the villain behind a rash of frog deformities across the United States, a suspicious character previously linked to this odd crime in California has now turned up in misshapen amphibians throughout the Northwest.

The suspect--a parasitic flatworm, or trematode--has also been found in the Minnesota pond where the discovery of dozens of frogs with twisted, missing, or extra legs touched off a hunt for the perpetrator.

In the 4 years since students at a Minnesota middle school chanced upon those misshapen northern leopard frogs, deformities have been reported in more than 50 amphibian species in 44 states.

Some scientists worry that the frogs are a "canary in a coal mine," the earliest victims of a developmental poison that may end up harming humans--too much ultraviolet (UV) light penetrating the thinning ozone layer, for example, or pollutants such as pesticides. But natural causes have also been suspected.

A team led by Pieter Johnson of Claremont McKenna College in Claremont, California, reported last spring that the trematode *Ribeiroia* forms cysts around frogs' pelvic area that may influence limb development by pushing cells around or secreting hormonelike chemicals.

The team infected tadpoles in the lab with the trematode and observed deformities in the metamorphosing frogs mirroring those seen in the field (*Science*, 30 April, p. 802). **HERPDIGEST** is a free, electronic weekly collection of herpetological scientific and conservation news and articles from newspapers, the Internet, government & non-profit press releases. Forwarded on to Frogcall by Carl Spears



Clean up, Australia

In the lead-up to Clean Up Australia Day 2000 on March 5, kids are being asked to paint or draw a poster to highlight the importance of a clean country. The winning entries will be posted as a "virtual poster" exhibition on a special Clean Up Australia website, hosted by Telstra, at www.cleanup.telstra.com.au. To enter, create a design

incorporating Scrappy the dog (he's on the website).

The first prize winner from each State will win an Esprit wardrobe to the value of \$100, a copy of *Bioviva* - a new board game about nature and the environment - and a Telstra sports bag. The second prize winner from each State will win an Esprit wardrobe to the value of \$100 and a Telstra AFL Collector Phonocard.

The winning school will receive a Compaq Presario computer and 30 hours of Telstra Big Pond Internet access each month for a year. Check the website for more information and send your entries by March 10 (don't use paper larger than A3 size or plastic coating!) to The Telstra Clean Up Australia Schools Competition, 18 Bridge Road, Glebe NSW 2037.



Why control cane toads?

In Australia cane toads have no natural enemies. Their toxin can kill most native animals that normally eat frogs. They therefore pose a risk to both native fauna and pets such as cats and dogs. Cane toads can use a wide variety of habitats and thrive in urban and disturbed areas. They have a voracious appetite and can eat a lot of different foods. They also breed quickly, allowing them to rapidly colonise and dominate an area. These abilities give cane toads a competitive advantage over native species.

Is it a cane toad?

Cane toads can sometimes be confused with native frogs. The distinctive features of the cane toad are shown opposite. Young cane toads look similar to some native frogs. For specimens over 4 cm long, the information provided should allow accurate identification. Smaller specimens require identification by a frog expert.

Care in handling cane toads and native frogs

Toxin is produced in the shoulder glands of cane toads and is present in the skin of the back. If squeezed tightly the toxin may be sprayed from the glands. When handling cane toads it is best to use rubber gloves and a firm but gentle grip. Avoid skin contact with this toxin and if it gets in your eyes, nose or mouth, seek medical attention.

Native frogs are susceptible to diseases and chemical residues that may be on your hands. If handling native frogs, hands or gloves should be clean and wet.

How you can help

If you suspect you have found a cane toad:

- Using the information provided, make sure it is not a native species. If in doubt, contact the nearest NPWS office.
- Humanely and safely dispose of any identified cane toads.
- If you find a cane toad outside the range indicated on the map, contact your local NPWS office.



Cane toads in NSW



Cane Toads are a threat to native animals. Our wildlife needs your help to stop the spread of cane toads in NSW by actively controlling existing populations and preventing them establishing in new areas

This brochure tells you where the crucial areas for cane toad control in NSW are, and how to identify cane toads from native frogs.



N S W
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Introduction and spread of the cane toad

Cane toads were introduced to Queensland from South America in 1935, in an unsuccessful attempt to control cane beetles, a pest of the sugar cane industry. Having no natural enemies, the toads spread west into the Northern Territory and south into New South Wales.

The range of the cane toad in NSW now extends along the coast from the Queensland border to the Iluka/Yamba area. An isolated breeding population has established further south at Lake Innes near Port Macquarie. Sporadic records are known from other areas including Sydney. These are usually due to accidental transportation of individual toads rather than local breeding populations. However, all cane toads should be reported to the NPWS and their source investigated.

The coastal area from Yamba to Port Macquarie is considered most vulnerable to being colonised by the cane toad. Particular effort in controlling outbreaks of cane toads in this area is needed to stop their southward spread and protect native wildlife.

Avoid transporting cane toads

Cane toads can be moved around accidentally. Be careful when travelling from cane toad infested areas or moving produce from those areas. You may have a cane toad stow-away.

Native frogs

Native frogs control insects that may otherwise become pests and are in turn food for many native animals. Populations of many native frogs have declined severely in recent times and some species are threatened with extinction. Spread of the cane toad may increase these threats.

Cane toads in northern NSW



Some native frogs that may be mistaken for cane toads are shown at right with their adult size and geographic range in NSW. Compare these native frogs with the cane toad shown overleaf.
Do not kill the animal unless you are sure it is a cane toad.



Great Barrid Frog, 8-11.5 cm – coastal areas.



Banjo Frog, 7-9 cm – widespread.



Native Toadlet, 3.5 cm – widespread.



Perons Tree Frog, 5 cm – widespread.



Painted Burrowing Frog, up to 4 cm – west of the Great Dividing Range.



Giant Burrowing Frog, 9 cm – south and central coast.



Ornate Burrowing Frog, 4.5 cm – north east NSW.



Marsh Frog, 4.5-6.5 cm – widespread.

FROG BIOLOGY

Frogs are amphibians most of which have a distinctly two-staged lifecycle the first aquatic (water) and the second terrestrial (land). Survival of frog populations requires suitable spawning sites, tadpole, juvenile, and adult habitats.

Frogs may be explosive breeders in which most of the population spawns over a short period, after heavy flooding rain, following a dry period. Summer explosive breeders generally have a shorter period from egg to juvenile than winter breeders. Alternatively frogs may breed intermittently during a long season, sometimes with the same female laying eggs on several occasions.

Egg masses are laid in water and develop into a filter-feeding and browsing tadpole. The number of eggs varies from 20-7000, the number depending on the size of the frog, egg size, and frequency of spawning. Eggs may be laid in foam nests, gelatinous egg strings, separately, or in shallow depressions next to ponds. Some male pond frogs, such as Striped Marsh Frogs, guard the eggs. Tadpoles filter pond water for algae, bacteria and suspended particles and increase water clarity and quality. They also provide an efficient conversion of pond nutrients and energy to food for wading birds and aquatic reptiles. Many snakes and tortoises will feed under water for tadpoles. Only about 1 in 20 tadpoles survives to change into a frog.

The tadpole eventually metamorphoses (they change form by growing legs and a more waterproof skin, absorbing their tail, trading gills for lungs, and developing a mouth and long tongue to catch prey) into a juvenile frog. They metamorphose in a shorter time in warmer water. After metamorphosis juvenile frogs leave the aquatic environment and feed on invertebrates (animals without backbones) such as insects and spiders. During this period the juvenile frog is particularly vulnerable to predation (being eaten), undergoing a dramatic body reorganisation and being restricted to pond margins. Leaving the aquatic environment may consist of simply occupying emergent vegetation or poolside shelter, or may involve considerable migration. Juveniles grow rapidly to maturity (frogs) with most types breeding in the first year. During suitable weather male frogs occupy breeding sites and begin calling to attract females. These sites may be in the water, on pond vegetation, or near the pond under shelter or on vegetation. Only male frogs call. They may congregate to form choruses for short periods or may call over time from established territories. Calling frogs do not necessarily mean successful spawning.

When not spawning many frogs can be difficult to find and their importance as predators and prey may be underestimated. Adult abundance, assuming breeding success and survival, is dependent on the amount of suitable habitat. Surprisingly some frogs sun bake to increase their body temperature allowing them to digest food and grow faster. These frogs wipe secretions over themselves to provide a sunscreen that reduces water loss. Most frogs also have skin secretions that are poisonous. These make the frog taste bad to predators, or parasites such as mosquitoes and leaches. If you handle frogs it is important to clean your hands before touching your eyes as these secretions will sting. Some of these secretions have proved of value as medicines.

sometimes growing extra limbs and some parasites cause this to happen. Frogs in captivity can live a long time, often from 5 to 15 years. However, in the wild with most species at least 9 out of 10 get eaten each year, giving them a fairly short average lifetime. That why they lay so many eggs. Female frogs are generally larger than males, up to twice the size. During the breeding season males have a darker throats and rough dark patches or spines on the pad of their thumbs.

The habits of adult frogs of many species are little known particularly forest frogs where the adults may live high in trees or desert frogs. Frogs can absorb water through their skin on their belly and thighs and do not necessarily have to have open water present. They can absorb water from wet surfaces and many tree dwelling frogs do not need to come to the ground except during breeding. Many frogs when resting fit their bodies snugly to flat surfaces and reduce water loss. There are no marine frogs although some species live in estuarine environments. Tadpoles can survive in 1 part seawater to 7 parts water.

There are three main groups of frogs in NSW. These are the tree frogs which have flattened disks on their fingers and toes (Hylids), allowing them to climb smooth steep surfaces, the ground frogs without disks (Myobatrachids), and one toad the introduced Cane Toad (Bufonids). There are two other groups in Northern Australia.

Amphibians have existed for 400 million years with many early aquatic ones (labyrinthodonts) growing to several meters and hundreds of kilograms in weight. However, dinosaurs and crocodiles replaced them in all waters except for the cold fresh waters of Australia, South America and Antarctica, which were joined into a super-continent located at the South Pole. They survived for another 40 million years until northern movement warmed the super-continent. Frogs have been around for 200 million years, and the ancestors of modern frogs were found in the Jurassic (135-190 million years ago). Many small carnivorous dinosaurs would have eaten frogs and their role in the ecology would have been as important then as it is now. The earliest Australian fossil frogs discovered are about 54 million years old and include examples of tree frogs and ground frogs very similar to those now found.

There are about 220+ frog species in Australia and 4000 in the world. The low number is probably because most of Australia lacks permanent water. The greatest concentration of species is in the wet eastern coasts and SW Western Australia. The Hunter/Lake Macquarie area is rich in frog species with 34 species found within 100 km.

Recently, many frogs have declined in numbers or become extinct. For some the reason is environmental degradation due to habitat destruction such as draining swamps, polluting creeks, or clearing the surrounding vegetation. There won't be anybody home if there's no home to go to! In suburbs for many species that seem adaptable to urbanisation as adults such as Bleeting Tree Frogs, Green Tree Frogs and Striped Marsh Frogs the population limiting factor seems to be lack of breeding sites (ponds). There is no reason that many of the coastal pond-breeding frogs cannot be maintained in suburbs with little effort. **From SOFAR (Society of Frogs and Reptiles) Newcastle "Frogs of the Hunter/Lake Macquarie Region with an Emphasis on Pond Frogs" Robert Browne**

AUSTRALIAN FROG CALLS - SUBTROPICAL EAST

1	Introduction	38	<i>Uperoleia laevis</i>
2	<i>Adelotus brevis</i>	39	<i>Uperoleia rugosa</i>
3	<i>Asa darlingtoni</i>	40	<i>Uperoleia tyleri</i>
4	<i>Crinia deserticola</i>	41	<i>Cyclorana alboguttata</i>
5	<i>Crinia parvinsignifera</i>	42	<i>Cyclorana brevipes</i>
6	<i>Crinia signifera</i>	43	<i>Cyclorana novaehollandiae</i>
7	<i>Crinia timula</i>	44	<i>Litoria aurea</i>
8	<i>Heleioporus australiacus</i>	45	<i>Litoria booroolongensis</i>
9	<i>Lechriodus fletcheri</i>	46	<i>Litoria brevipalmata</i>
10	<i>Limnodynastes convexiusculus</i>	47	<i>Litoria caerulea</i>
11	<i>Limnodynastes dumerilii dumerilii</i>	48	<i>Litoria castanea</i>
12	<i>Limnodynastes dumerilii grayi</i>	49	<i>Litoria chloris</i>
13	<i>Limnodynastes fletcheri</i>	50	<i>Litoria citropa</i>
14	<i>Limnodynastes ornatus</i>	51	<i>Litoria cooloolensis</i>
15	<i>Limnodynastes peronii</i>	52	<i>Litoria dentata</i>
16	<i>Limnodynastes salmini</i>	53	<i>Litoria fullax</i>
17	<i>Limnodynastes tasmaniensis</i>	54	<i>Litoria freycineti</i>
18	<i>Limnodynastes terraereginae</i>	55	<i>Litoria gracilenta</i>
19	<i>Mixophyes balbus</i>	56	<i>Litoria inermis</i>
20	<i>Mixophyes fasciolatus</i>	57	<i>Litoria jervisiensis</i>
21	<i>Mixophyes fleayi</i>	58	<i>Litoria latopalmata</i>
22	<i>Mixophyes iteratus</i>	59	<i>Litoria lesueuri (north)</i>
23	<i>Neobatrachus sudelli</i>	60	<i>Litoria lesueuri (south)</i>
24	<i>Paracrinia haswelli</i>	61	<i>Litoria littlejohni</i>
25	<i>Philoria Type B</i>	62	<i>Litoria nasuta</i>
26	<i>Philoria kundagungan</i>	63	<i>Litoria olongburensis</i>
27	<i>Philoria loveridgei</i>	64	<i>Litoria pearsoniana</i>
28	<i>Philoria Type C</i>	65	<i>Litoria peronii</i>
29	<i>Philoria sphagnicolus</i>	66	<i>Litoria phyllochroa (north)</i>
30	<i>Pseudophryne australis</i>	67	<i>Litoria phyllochroa (south)</i>
31	<i>Pseudophryne bibronii</i>	68	<i>Litoria revelata</i>
32	<i>Pseudophryne coriacea</i>	69	<i>Litoria rothii</i>
33	<i>Pseudophryne major</i>	70	<i>Litoria rubella</i>
34	<i>Pseudophryne raveni</i>	71	<i>Litoria subglandulosa</i>
35	<i>Rheobatrachus silus</i>	72	<i>Litoria tyleri</i>
36	<i>Taudactylus pleione</i>	73	<i>Litoria verreauxii verreauxii</i>
37	<i>Uperoleia fusca</i>	74	<i>Bufo marinus</i>



So, you're the proud owner of David Stewart's frog call CD, but are not quite happy with the back cover. Perhaps you are unfamiliar with those so-called common names (some of which appear not to be in general use in the Sydney Region), or you prefer to use scientific names. If so, get a pair of scissors and the CD case. Cut out the new list above, following the lines. Remove the CD from its case, unclip the disc holder (the flat bit with the circular clip) and lift out of the tray. Remove the printed back cover. Insert new list, and replace back cover, disc holder and CD. There you are.

If you haven't got a frog call CD yet, keep this page and purchase one from FATS

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Thank You to all those who contributed to this newsletter

We hold six informative, informal, topical and practical meetings each year at the Australian Museum, Sydney (William Street entrance). Meetings are held on the first Friday of every **even month** (February, April, June, August, October and December) at 7 pm for a 7:30pm start. **NO MEETINGS ARE HELD ON GOOD FRIDAY** so check newsletter for alternate dates. Visitors are welcome. We are actively involved in monitoring frog populations and in other frog studies, and we produce the newsletter *FROGCALL* and *FROGFACTS* information sheets. All expressions of opinion and information are published on the basis that they are not to be regarded as an official opinion of the Frog and Tadpole Study Group Committee unless expressly so stated.