

FROG CALL

THE FROG AND TADPOLE STUDY GROUP NSW Inc.

Facebook: <https://www.facebook.com/groups/FATSNSW/>

Email: fatsgroupnsw@fats.org.au

PO Box 296 Rockdale NSW 2216

Frogwatch Helpline 0419 249 728

Website: www.fats.org.au

ABN: 34 282 154 794

NEWSLETTER No. 160 APRIL 2019

Last FATS meeting, Kathy Potter, Punia Jeffery, Karen White and Simon Clulow (our main speaker), with his and Mike Swan's new Australian Geographic book "A complete guide to Frogs of Australia"



You are invited to our FATS meeting. It's free. Everyone is welcome.

Arrive from 6.30 pm for a 7pm start.

Friday 5 April 2019

FATS meet at the Education Centre, Bicentennial Pk, Sydney Olympic Park

Easy walk from Concord West railway station and straight down Victoria Ave.

Take a torch.

By car: Enter from Australia Ave at the Bicentennial Park main entrance, turn off to the right and drive through the park. It's a one way road.

Or enter from Bennelong Rd / Parkway. It is a short stretch of two way road.

Park in P10f car park, the last car park before the Bennelong Rd. exit gate.

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FATS meeting, Friday 5th April 2019

6.30 pm Lost frogs seeking forever homes: 2 Green Tree Frogs *Litoria caerulea* and 1 *Litoria infrafrenata* White-lipped Tree Frog, Priority to new pet frog owners. Please bring your membership card and cash \$50 donation. Sorry, we don't have EFTPOS. Your NSW NPWS amphibian licence must be sighted on the night. Adopted frogs can never be released.

7.00 pm Welcome and announcements

7.30 pm Our main speaker is Glenn Shea
His topic is "The Early History of Sydney's Frogs"
Punia Jeffery will talk about Axolotls

9.00 pm Show us your frog images. Tell us about your frogging trips or experiences. Guessing competition, frog adoptions continue, supper, relax and chat with frog friends and experts.

LAST FATS MEETING 1 FEBRUARY 2019

Punia Jeffery opened our first meeting of the year, welcoming those in attendance, giving announcements and field trip reminders.

Many conservation biologists had opportunities as a child to experience and build a love of Australian native animals. Frog researcher, Simon Clulow our April main speaker is one of them. The photo below is young Simon. In the past, FATS have had several young members in our society, who joined our society as children (over the last 3 decades) and now work as scientists.



Simon Clulow spoke about frogs and his Australian Geographic book, A complete guide to Australian Frogs which he produced with avid herpetologist and former zookeeper, Mike Swan. Jess Teideman the assistant editor from Australian Geographic came to the meeting with copies of the new book, which were for sale. Simon mentioned the book includes one of his favourite field location The Watagans. FATS have annual trips there.

Simon took us on a photographic journey, recounting some fascinating stories: It all started in a Queensland rainforest stream in the 1970's. A young PhD student David Liem sent Mike Tyler some adult aquatic frogs to investigate. When they arrived in South Australia there was a juvenile in the container. Mike thought it was just a mistake. He went back to the frog arrivals and found two juveniles. What they discovered was the Gastric Brooding Frog. One of the most remarkable creatures.

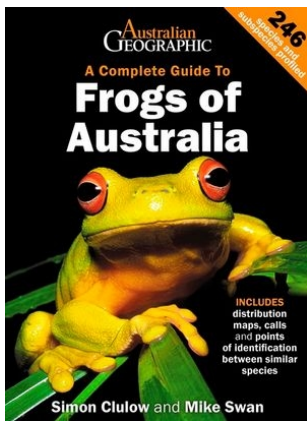
This was such an important discovery they sent the findings to the journal "Nature", who declined the article, assuming it was a hoax. That happened one other time. Nature refused to accept a previous article about the platypus!

Unfortunately, the aquatic frog became extinct shortly after. Another Gastric Brooding Frog was discovered in the early 1980s by Mike Mahoney but by 1986 it too was extinct. These sad events led Simon to dedicate his life to biology, research and diverse, unique Australian frogs.



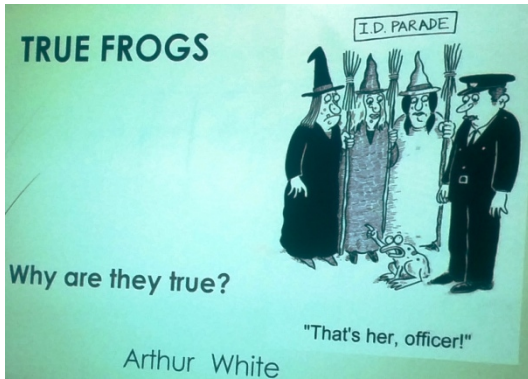
Above and below three of the many images Simon spoke about.



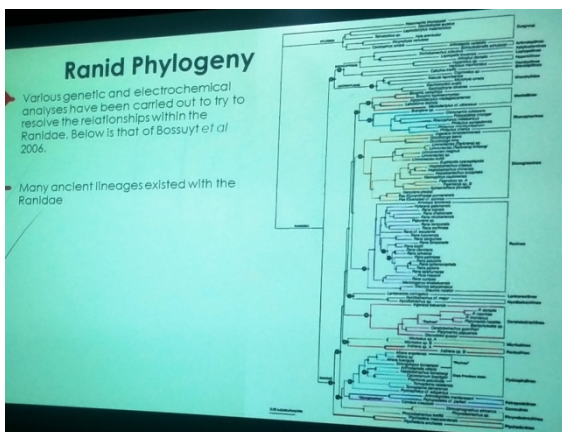


FATS strongly recommend to all frog fanciers, this comprehensive Australian frogs guide by Simon Clulow and Mike Swan.

Arthur White posed the puzzle, Are True Frogs true? Does that mean some frogs are not true? The term first appeared in the 1700's in France but then took on a taxonomic status. Back then frog biology wasn't intense. Only animals of agricultural value were studied. However when food became scarce the first distinction that was made was which frogs are edible. True frogs could be eaten and had smooth skin.



At the same time people were beginning to record uses of plants. The people who did pioneering experiments on animals and plants were labelled as witches, straight away. Some of these women discovered antibiotics in "True Frog" secretions, which could be used to preserve food. The name Ranid was associated with the True Frog family, which is abundant across the planet.



In the world of taxonomy and phylogenetics Ranid were one quarter of the world's frogs. But in the last 40 years it was reassessed. Meanwhile more Ranid species were being discovered worldwide. As frog taxonomy research evolved so did the question of which of the 500+ frogs in Ranid belonged there.

The True Frogs, family Ranidae, have the widest distribution of any frog family. Typically, True Frogs are smooth and moist-skinned, with large, powerful legs and extensively webbed feet. The true frogs vary greatly in size, ranging from small—such as the wood frog *Lithobates sylvatica* to the largest frog in the world, the goliath frog *Conraua goliath*. Many of the True Frogs are aquatic or live close to water. Most species lay their eggs in the water and go through a tadpole stage.

Punia Jeffery spoke about endangered axolotls and salamanders. Over the last few meetings, she has presented a series of interesting short talks, videos and images, which have been very informative.



Arthur White talked about frogs fossilised in amber.

There are many examples of frogs in Baltic amber (Miocene 6-8 million years old myo) In 2010 four frogs in amber were discovered in Myanmar, from the Cretaceous period, dated 98 myo. They were the ancestors of Fire Bellied Toads and demonstrate that frogs evolved much faster than expected. The frogs were so similar to modern frogs that scientists believe the ancient body form of frogs worked so well that it has been modified very little over the last 100 million years. Evolution doesn't work as a continuous process at all, it works in fits and starts.



FATS AGM NOTICE FRIDAY 2 AUGUST 2019

The FATS AGM will be held on Friday 2/8/2019, commencing 7pm. FATS meets at the Education Centre, Bicentennial Park, Sydney Olympic Park. If you would like to ask any questions about joining the FATS committee, please give us a call. Contact our President Arthur White at least two weeks before the meeting for further information and to submit items. We appreciate fresh ideas and new members on our committee. No experience required. The committee meets 6 times a year. No task commitments or time expected of committee members, other than what you are able to spare. See contacts details on page 11. **Arthur White**

FROGS WERE MYSTERIOUSLY DYING ACROSS THE GLOBE: JOYCE LONGCORE CRACKED THE CASE



Joyce Longcore. courtesy of the University of Maine

Joyce Longcore's unorthodox career as a mycologist peaked in a stunning burst of achievement in 1997, which later resulted in a Golden Goose Award. Longcore, Associate Research Professor at the University of Maine in Orono, nailed the mysterious organism that was decimating frog populations all over the world as a chytrid, an obscure aquatic fungus, and devised a way to isolate it into pure culture so it could be studied by other researchers.

Two veterinary scientists at the Smithsonian National Zoo, Don Nichols and Allan Pessier, found Longcore while trying to figure out what was killing the zoo's blue poison dart frogs. They saw her ultrastructural photos of chytrids on a website of zoospore fungus that University of Maine mycologist Mel Fuller maintained. So they sent images of the organism they were dealing with. "I could tell by looking at it it was a chytrid," Longcore said.

The Smithsonian scientists soon sent her fresh samples of infected frog skin. Longcore was a dab hand at isolating chytrids, her specialty, into pure culture. This strange new type took a couple of tries, but on her birthday, over the long Columbus Day weekend, Longcore went into the lab and saw that the liquid medium she had put the culture in had turned opalescent: something was growing there. Under the microscope, she could see it was a fungus. She had found a way to get the chytrid to proliferate. Those were heady days, Longcore recalled, as research teams around the world raced to match the newly named *Batrachochytrium dendrobatidis* (*Bd*) with their own local die-offs. Ever since her groundbreaking discovery, Longcore has been included in research teams and invited to teach isolation techniques and participate in conferences. When the grant money was flowing (and only then, because she wasn't salaried), she even got paid. "*Bd* is the big thing publicly, and it was a lot of fun, getting frogs in the mail every day, but I liked the systematics of the group"—mycologists, that is, other scientists who love the strange creatures of this discrete kingdom of living things — "figuring out the amazing diversity." Longcore grew up in rural southwestern Michigan. She was an impressive mycologist even in her undergraduate days at the University of Michigan at Ann Arbor, and she spent an additional year there after graduation working for Frederick Sparrow, a leading authority on aquatic fungi.

She got her master's degree from Indiana University, and then married Jerry Longcore, who worked as a field biologist with the United States Fish and Wildlife Service and, later, the U.S. Geological Survey. After the birth of their first child in 1967, Joyce didn't work in the lab for 18 years. For much of that time, the family lived in Orono. Longcore recalled. "I didn't pine for this science

business, though. I couldn't flirt around the edges. I had to have a project." When her older son went to college, Longcore considered getting a part-time job in a grocery store. Then Joan Brooks came calling with that aforementioned project. Brooks, a biologist at Orono who later developed a peat-based sewage filtration system, needed a mycologist for a study of aquatic systems. Another Orono professor remembered Longcore from college at Ann Arbor and recommended her. Longcore recalled. Her most valued tool still is the light microscope she got in order to work with Brooks in the 1980s. When that project ended, Longcore went back for her Ph.D. at the University of Maine. The logical progression then was to get a grant and do research, but "I didn't get a grant," she said. However, with space in a colleague's lab and her trusty microscope, Longcore did her own research and published it.

"I haven't been paid for years and years, but my department has been very supportive," said Longcore, who is presently in the process of moving her frozen chytrid collection to the University of Michigan, and "trying to plan ahead a little bit" as she approaches her 80th birthday.

Chytridiomycota, the chytrid group, are ancient, water-loving fungi; even types that live in soil need free-running water to disperse their motile spores, equipped with flagella to help them swim. *Bd*'s parasitism is a departure from the chytrids' usual habits (though a different chytrid also preys on salamanders). Amphibians rely on their skin for breathing. The disease *Bd* causes, Chytridiomycosis, thickens frogs' and toads' skin to the point where that function ceases. The disease has mortality rates that approach 100 percent in some populations. *Bd* appears to have arisen only within the past century on the Korean peninsula, and dispersed around the world in just a few decades.

Advances in technology and genomics make it possible now to see the differences among various fungi at the cellular level. When Longcore was starting out, morphology was the chief method for categorizing them. Scientists are only beginning to understand the role fungi play in biology, she said. Fungi may help trees to talk to one another in a field, for example. Orchid seeds depend on fungus to get started. Some fungi work in decomposition, clearing away detritus; we use some, like mushrooms, as food; still others are parasites.

Asked if fungi are important, Longcore said, "Oh my goodness, yes! Fungi hold the world together."

https://www.aaas.org/blog/member-spotlight/frogs-were-mysteriously-dying-across-globe-joyce-longcore-cracked-case?utm_source=membercentral&utm_medium=email&utm_campaign=membercentral-21393&et rid=8000025&et_cid=2383743
12/9//2018 by Delia O'Hara
Member Spotlight American Association for the advancement of Science.

FROGBITS AND TADPIECES

Photo by Lydia Fucsko *Litoria peroni*



Reference to Boulenger's "Catalogue of the Batrachia Salientia in the British Museum" (1882) shows about fifty species to be therein recorded from Australia and Tasmania, while last year the same gentleman described two additional species; of these New South Wales may be credited with about thirty, and the County of Cumberland with about twenty. This number suffices to show how rich in Batrachians the neighbourhood of Sydney is, though owing to the steadily increasing area required for settlement, the consequent removal of sheltering logs and stones, the contamination of the ponds and creeks with sewage, and the increasing numbers of ducks, geese, and small boys, the collector of frogs already has to lament the devastation of some of the best collecting grounds in the neighbourhood.

Marion Anstis shares this quaint quote above, showing observations on Sydney frogs by Boulenger in 1882.



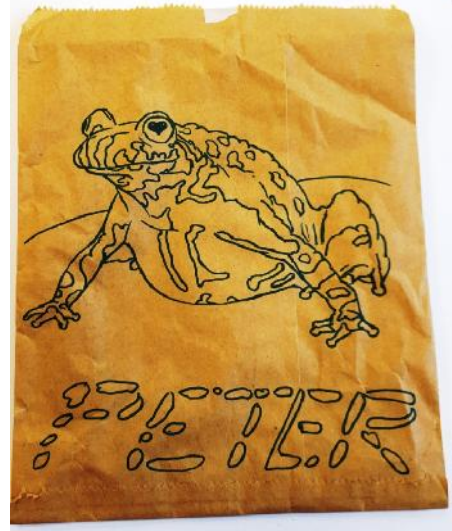
Photo by John Pumpurs *Litoria fallax* males fighting

2019 FATS FROG-O-GRAPHIC COMPETITION

The FATS members' 2019 Frog-O-Graphic competition opens 1st May and closes 31st August 2019. Categories: Best Frog Image, Best Pet Frog Image, Most Interesting Image & People's Choice.

Category winners are decided by a panel of judges. People's Choice is voted for by everyone present at the October FATS meeting. All entries are by email to photos@fats.org.au Please state: your name, confirm that you are a financial FATS member, identify the frog species preferably by scientific name (in the file name) and location, if known, whether the image is a pet frog and your contact phone number. Max 6 entries per person. Max attachment size 6 MB. Fabulous prizes awarded. Entries must be original and your own work. The entries may appear in FrogCall, Facebook, our web site and other FATS publications. Arthur White

Lunch bag ! drawn by Claire Elizabeth Middleton



COME AND SEE THE FROGS AT THE 2019 ROYAL SYDNEY EASTER SHOW Photo of Rob Burns' Green and Golden Frogs amplexing at the show. Contact Kathy Potter if you can spare a couple of hours as a frog explainer.

IS “COOLING THEN FREEZING” A HUMANE WAY TO KILL AMPHIBIANS AND REPTILES?(extracts)

What is the most humane way to kill amphibians and small reptiles that are used in research?

Historically, such animals were often killed by cooling followed by freezing, but this method was outlawed by ethics committees because of concerns that ice-crystals may form in peripheral tissues while the animal is still conscious, putatively causing intense pain. This argument relies on assumptions about the capacity of such animals to feel pain, the thermal thresholds for tissue freezing, the temperature-dependence of nerve-impulse transmission and brain activity, and the magnitude of thermal differentials within the bodies of rapidly-cooling animals.

A review of published studies casts doubt on those assumptions, and our laboratory experiments on cane toads (*Rhinella marina*) show that brain activity declines smoothly during freezing, with no indication of pain perception. Thus, cooling followed by freezing can offer a humane method of killing cane toads, and may be widely applicable to other ectotherms (especially, small species that are rarely active at low body temperatures). More generally, many animal-ethics regulations have little empirical basis, and research on this topic is urgently required in order to reduce animal suffering.

Concern about the ethical treatment of animals has prompted extensive discussion of how to minimise suffering. Unfortunately, human intuition may fail to predict the stress and suffering of species that are only distantly related to us (Rose, 2002, 2007; Stevens, 2004; Langkilde and Shine, 2006). For example, mammals and birds typically react to falling ambient temperatures by attempting to maintain body temperature (by increasing metabolic heat production).

Thus, exposure to low temperatures may cause intense discomfort. In contrast, many amphibians and reptiles exhibit highly variable body temperatures in the course of their day-to-day lives, and react to falling temperatures by becoming torpid (Pough, 1980; Frankenhaeuser and Moore, 1963; Rosenberg, 1978; Roberts and Blackburn, 1975; LaManna et al., 1980; Hunsaker and Lansing, 1962). Periods of low body temperature associated with inactivity are common on a seasonal or even daily basis for many ectotherms, even for species (such as lowland tropical taxa, and diurnal heliotherms) that spend most of their activity time at relatively high body temperatures (Pough, 1980).

The immobility and unresponsiveness of such “high-temperature” ectotherms at low ambient temperatures suggest that their brain activity is reduced when they are cold. If that is true, then such animals could be humanely killed by cooling them to induce torpor (to reduce brain activity and thus, pain perception); and then reducing their temperature even further, to lethal levels. This was a popular method for humane killing of experimental animals for many years (McDonald, 1976), widely endorsed by animal welfare organisations (NSW Animal Welfare Advisory Council, 2004). However, opinion has shifted. Globally, modern veterinary guidelines now rule that “cooling then

freezing” is ethically unacceptable (e.g. <https://www.avma.org/kb/policies/documents/euthanasia.pdf>). Ethics guidelines rarely cite primary research literature (Martin, 1995), and the argument against “cooling then freezing” rests upon a hypothesis rather than specific empirical data.

The hypothesis is that temperatures low enough to induce ice-crystal formation in peripheral tissues are nonetheless high enough to allow painful sensations to travel through peripheral nerves and reach the brain, which in turn is warm enough to register those sensations as painful (Sharp et al., 2011). The plausibility of this scenario depends upon the temperatures at which ice crystals form relative to the temperatures at which nerves and brains cease to function; and on the magnitude of thermal differentials within an animal's body during rapid cooling.

To evaluate this scenario, we (a) reviewed published literature on thermal dependency of nervous-system function to examine the assumptions that have outlawed “cooling then freezing”, and (b) measured brain activity and limb-core thermal differentials directly in ectotherms while they were being frozen. As a case study, we used the cane toad (*Rhinella marina*). These invasive anurans are spreading across Australia (Urban et al., 2007), fatally poisoning native predators (Shine, 2010). Community “toad-busting” groups kill many thousands of toads annually, by a variety of methods – some of which appear to be cruel (Clarke et al., 2009) or unreliable (Sharp et al., 2011); toads are also killed for university teaching and research. The prohibition on “cooling then freezing” has outlawed the most readily accessible method for killing ectotherms: for example, current guidelines for euthanasia of cane toads recommend blunt trauma or decapitation (Sharp et al., 2011), methods poorly suited to use by untrained people. Thus, the cane toad offers an excellent example of why it is important to know whether or not the prohibition of euthanasia via hypothermia is based on rational grounds.

Review of published literature

There is significant scientific debate about whether or not ectothermic vertebrates experience “pain” in the way that humans understand the term; several authorities suggest that we should talk of “nociception” instead (Rose, 2002, 2007; Stevens, 2004). Even if a noxious stimulus induces activity in the brain, the process may not involve anything comparable to “pain” as perceived by humans (Key, 2015).

Nonetheless, although the subjective experience of a cane toad may be very different to that of a human, most animal ethics committees (and the wider community) continue to believe that amphibians can feel pain.

Even if we accept the contested point that an amphibian is capable of feeling pain, our review of published literature does not support the idea that placing a pre-cooled ectotherm into a freezer is inhumane, for at least four reasons:

When a small ectotherm is pre-cooled and then placed into a freezer, thermal differentials within its body are minor (Hillman et al., 2009; Wilson et al., 2009; Bicego et al., 2007) and thus, the animal's brain cools almost as rapidly as do its limbs. Its neural network is likely to be close to freezing by the time that ice crystals form in peripheral tissues.

Small animals cool to well below 0°C before freezing begins, allowing time for deep-body temperatures to fall to low levels. In anurans, ice crystals form at -1 to -4.3°C (Hillman et al., 2009). Thus, the critical issue is whether peripheral nerves can transmit nociceptive signals when the superficial tissue of the animal falls below -1°C. In ectotherms, transmission velocities for nerve impulses fall rapidly at low temperatures (Frankenhaeuser and Moore, 1963), and cease at temperatures close to 0°C: for example, 1.3–4°C in tortoises (Rosenberg, 1978), 0–2°C in frogs (Roberts and Blackburn, 1975). In frogs, the nociceptive peripheral neurons cease functioning at higher temperatures than do those transmitting signals such as touch or proprioception (Roberts and Blackburn, 1975).

Cold is an anaesthetic (Wilson et al., 2009). Even a modest reduction in skin temperature reduces painful sensations in mammals (Bicego et al., 2007). In amphibians, minor cooling of one limb (to 6°C) reduces the animal's reaction to noxious stimuli (Suckow et al., 1999). In cane toads, low temperatures have the same structural and electrophysiological effects on myelinated nerves as do local anaesthetics such as lidocaine (Luzzati et al., 1999). Thus, nerve endings close to the peripheral tissues being frozen are unlikely to transmit nociceptive (“pain”) signals.

Normal brain functioning is dependent upon temperature in ectotherms. The brains of cane toads fail to respond to electrical stimulation below 3.2°C (LaManna et al., 1980), broadly similar to many other ectotherms (Hunsaker and Lansing, 1962).

Experimental study

A toad's limb and deep body temperature closely followed ambient temperature (Fig. 1A,B,C); differentials between the animal's skin and its core averaged <1°C (Fig. 1D). Accordingly, we recorded a continuous smooth decline in brain activity from fridge to freezer (Fig. 2). We saw no evidence of increased EEG activity, across any frequency bandwidths, as has been reported in animals exposed to painful stimuli (Lambooj et al., 2002; Zulkifli et al., 2014). Instead, the brain became electrically ‘quiet’ with decreasing temperature.

DISCUSSION

Collectively, general features of the thermal dependency of nerve and brain function in ectotherms suggest that for cane toads (and potentially, for many species of amphibians and reptiles), cooling-then-freezing can offer a humane death. By

the time that ice crystals form in peripheral tissues, the brain is almost as cold as those tissues; and hence, is unable to perceive or respond to nociceptive signals. Our experimental study on cane toads supported this more general result.

Clearly, there are caveats to this conclusion. First, it is important to pre-cool the animal before exposing it to freezing temperatures. Second, the potential for freezing to induce nociceptive signals will be greater for larger animals, which can maintain greater thermal differentials between the brain and peripheral tissues (Key, 2015), and have higher crystallisation temperatures (Lee and Costanzo, 1998). However, the toads that we used (>200 g) were far larger than adults of most amphibians and reptiles. Mean adult mass >100 g occurs in <5% of amphibian species and <10% of lizard species (Pough, 1980), so our results have broad applicability. Third, low temperatures may not suppress nerve impulses as effectively in cold-adapted species, or cold-acclimated individuals, as they do in tropical taxa (Key, 2015). Species-specific studies are essential before applying hypothermia to kill individuals of any amphibian or reptile taxa that are routinely active at low body temperatures.

Despite these caveats, our review of published literature and experiments on cane toads suggest that for many ectotherms (especially small-bodied, warm-climate taxa), cooling then freezing offers a humane form of euthanasia. Unfortunately, this simple, readily-accessible method is currently outlawed internationally by ethics committees: not because of contrary evidence, but because of speculation combined with a lack of critical analysis of available literature, and a dearth of empirical research. Similar problems extend to many other ethics issues (Langkilde and Shine, 2006). There is no point blaming the members of ethics committees; they are doing the best job they can, but cannot be expected to evaluate primary research literature or conduct their own experiments.

We urgently need researchers to take up the challenge of clarifying which methods are humane, and which are not. Until scientists provide that evidence, animals will continue to suffer unnecessarily.

**Richard Shine,^{1,*} Joshua Amiel,¹
Adam J. Munn,² Mathew Stewart,²
Alexei L. Vyssotski,³ and John A. Lesku⁴**
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760–763. PMC4571096 PMID: 26015533**
**Published online 2015 May
26. doi: 10.1242/bio.012179**
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4571096/> **Thanks for sharing on FATS**
Facebook page Rose Upton

ENDANGERED NORTHERN CORROBOREE FROG GETS INCREASED SEX APPEAL WITH IVF-STYLE HORMONE TREATMENT



The hormone was applied to the bellies of northern corroboree frogs in an effort to boost their sexual desire. (Supplied: University of Wollongong)

Australian researchers say a world-first method to get an endangered frog species "in the mood to mate" could be a vital way of saving endangered amphibians across the world.

Key points:

- More than 800 frog offspring have been released in the Brindabella Ranges
- Researchers hope the program will help boost genetic diversity in wild populations
- The program has been described by scientists as easy, user-friendly and cost effective

The northern corroboree frog, found in cold, highly-elevated parts surrounding Canberra, are under threat from feral pigs and horses, fire, drought and forestry operations. An added challenge for boosting numbers of the frog is a strong mating bias in captivity, which has meant less than a third of males have success in mating.



The trial has proven successful for boosting sex appeal among northern corroboree frogs, but could be potentially used among other species. (Supplied: Michael McFadden)

Far from the romantic cues of dimming the lighting or putting on sensual music, this project has involved putting hormones onto the bellies of frogs to boost desire. As part of a four-year trial, University of Wollongong (UOW) and Taronga Zoo experts administered the hormone topically on the frogs as they were paired for breeding. So far, more than 800 offspring at different developmental stages — as eggs, tadpoles and young frogs — have been released in the Brindabella Ranges on the NSW/ACT border.

UOW reproductive biologist Dr Aimee Silla said getting frogs in a frisky state was a challenge when breeding them in captivity as they needed "a little bit of a nudge". "They are so finely-tuned into environmental stimuli to actually get their hormones going and basically get them in the mood to reproduce," Dr Silla said. "All animals need the right cues, whether that's environmental cues, so temperature, rainfall or humidity. Reproduction is a lot more complex than it might appear to be." Dr Silla said while the breeding program was only possible in captivity, it would help boost the number of offspring and their potential to adapt to threats. "It's about putting as many offspring into the wild as possible and with as much genetic diversity as possible so that we can try and recover the species in the wild," she said.

"They can hopefully then do their thing unassisted and once there's enough of them breeding again in the wild then we can kind of take a step back and hopefully we won't have to intervene in the future."

Potential for expansion into developing world The synthetic gonadotrophin-releasing hormone is the same used in IVF and is traditionally applied as an injection through the skin. But Dr Silla, who worked alongside Dr Phillip Byrne said putting the hormone straight on the stomach eliminated the need for an injection and was more easily absorbed.

"The really great thing about this protocol is that it's easy, it's user-friendly, cost-effective," she said. "And we're really hoping that not just for the northern corroboree frogs, but for threatened species globally, this protocol can be taken onboard. "Particularly in developing countries where they might not have as much access to the training required to inject animals safely." **Posted 6 Dec 2018, ABC**

Illawarra By Gavin Coote and Melinda James <https://www.abc.net.au/news/2018-12-06/endangered-frog-increases-sex-appeal-with-hormone-treatment/10589862?smid=Page:%20ABC%20Australia-Facebook%20Organic&WT.src=Facebook%20Organic&sf203738281=1>

FROGBITS AND TADPIECES

The Revelator - Wild, Incisive, Fearless. An initiative of the Center for Biological Diversity *The reticulated siren, courtesy of Pierson Hill* Swampy Thing: The Giant New Salamander Species Discovered in Florida and Alabama



After decades of rumours and searches, the existence of a two-foot-long amphibian called “the reticulated siren” has finally been confirmed. *December 5, 2018 - by John R. Platt* Locals have long spoken of a mysterious creature they called a “leopard eel,” and Robert Mount’s 1975 book *The Reptiles and Amphibians of Alabama* mentioned an unnamed siren, but no one had been able to prove its existence. For more than a decade, people had stopped looking. The hard work paid off, though. A paper by Steen, Graham and other researchers published today in the journal *PLOS ONE* describes the new species and names it the reticulated siren (*S. reticulata*). According to the paper the completely aquatic salamander lives in northwest Florida and southern Alabama and has a slimy, eel-like body with irregular spots on its skin, two forelegs, no back legs, and a set of gills just behind its head. It’s about the length of North America’s largest salamander, the Hellbender (*Cryptobranchus alleganiensis*), but much slighter of build.



The reticulated siren, courtesy of Pierson Hill

There are still numerous species yet to be discovered, and like their known counterparts they’re all facing a growing number of threats. The time to save these species grows shorter with each passing year. “We just don’t know what we’re losing because we haven’t done the formal work to figure out what species are still out there,” he says. For at least one species, though, that first step has finally been taken.

https://therevelator.org/giant-salamander-discovered/?fbclid=IwAR3MM5XhfG8ACpYKYG8-ESE_gGfOYpKavEkHjmECG3WDppiwNAzvwoRteCQ

Ecology is non-linear – Ecological Society of Australia Gold Medal winner Professor Chris Dickman from The University of Sydney, in recognition of his contributions to ecology. Chris is one of Australia’s foremost ecologists. He is renowned for his groundbreaking work on the ecology and dynamics of arid ecosystems, mammalian ecology and conservation particularly long-term research in the Simpson Desert. “He’s a great mentor, great supervisor, and a great bloke,” said ESA President Don Driscoll in presenting the award.

<https://www.ecolsoc.org.au/news/2018/11/ecology-non-linear-%E2%80%93-esa-gold-medal-winner-chris-dickman>



The olm or proteus (*Proteus anguinus*) is an aquatic salamander in the family Proteidae, the only exclusively cave-dwelling chordate species found in Europe. In contrast to most amphibians, it is entirely aquatic; it eats, sleeps, and breeds underwater. Living in caves found in the Dinaric Alps, it is endemic to the waters that flow underground through the extensive limestone bedrock of the karst of central and south eastern Europe and is known to be able to go for 10 years without food due to its low metabolism.

Image: https://animaldiversity.org/accounts/Proteus_anguinus/



NOCTURNAL CANE TOADS PERFORM 'EXTREMELY RARE' PHASE SWITCH, BECOMING DIURNAL IN KIMBERLEY GORGES (extracts)



Gorges in the Kimberley can be deep and narrow, cool and wet — ideal for cane toads during the day. photo Dr Simon Clulow)

Most animals are biologically locked into being nocturnal or diurnal, but cane toads are proving they have super pest powers and can switch when conditions are right.

Key points:

- Cane toads were observed in the Kimberley's deep and rocky gorges out, active and foraging in the middle of the day
- The environmental biologist found the daytime toads had reversed their normal 24-hour cycle, known as 'phase shift'
- The toads have already been found to have exceptional abilities including rapid evolution, high toxicity, and incredible rates of reproduction

The surprise finding was made by researchers studying the invasive toads as they advance across the Kimberley region in Australia's remote north-west.

Simon Clulow, an environmental biologist from Macquarie University, and lead author Sean Doody from the University of South Florida, published their findings in Scientific Reports last week after studying the impacts the poisonous toads have had on native wildlife in the past 10 years. Dr Clulow had been accustomed to observing toads at night as the introduced amphibian would hide from the hot Australian sun during the daytime. But when he ventured into some of the Kimberley's deep and rocky gorges, he found cane toads behaving in a very unusual manner.

Rare example of phase shifting

The daytime toads Dr Clulow found were not just a one-off sighting; the cane toads had reversed their normal 24-hour cycle.

Dr Clulow said there were only a few other known examples of nocturnal animals becoming day-active, or diurnal animals. He said the reason it was so rare is because it was a very difficult biological change to make.

The cane toads that have made the leap to becoming diurnal are living in deep gorges where they are protected from the hot sun. While this appears to explain how the moisture-loving toads survive being active in the day, Dr Clulow said his team did not understand why the toads made the change.

The ultimate pest

Australian scientists have been studying cane toads since they were introduced in a failed attempt to control the cane beetle — a pest of sugar cane crops — in 1935. They have found the amphibians have a range of exceptional abilities, including rapid rates of evolution, high toxicity, and incredible rates of reproduction. This latest finding further demonstrates the toad's potential to conquer new territory.



Dr Simon Clulow with a magnificent tree frog, a native frog potentially impacted by the arrival of cane toads. (Supplied: Dr Simon Clulow)

Adaptable predator must not be underestimated

Conservation biologist Mike Letnic from the University of New South Wales is an expert in how cane toads have invaded increasingly arid parts of Australia. He agrees this latest research demonstrates that cane toads are among the most adaptable of animal pests. He said this finding was further warning not to underestimate how much of Australia could be impacted by cane toads. Cane toads are now found halfway across the remote Kimberley region where Dr Clulow has been documenting their impact on native animals.

https://www.abc.net.au/news/2019-01-22/cane-toads-change-from-nocturnal-to-diurnal-in-kimberley/10732102?fbclid=IwAR3ZZQDEoQJ_E4N0hyQUlvsomjZ3KtAeSjQ2ECswcS8ZiZVv3T40Mu-aMc ABC Kimberley By Ben Collins

FATS MEETINGS commence at 7 pm, (arrive from 6.30 pm) and end about 10 pm, at the Education Centre, Bicentennial Park, Sydney Olympic Park, Homebush Bay. They are usually held on the **first Friday of every EVEN month** February, April, June, August, October and December. Call, check our web site, Facebook page or email us for further directions. We hold 6 informative, informal, topical, practical and free meetings each year. Visitors are welcome. We are actively involved in monitoring frog populations, field studies and trips, have displays at local events, produce the newsletter FROGCALL and FROGFACTS information sheets. FATS exhibit at many community fairs and shows. Please contact Events Coordinator Kathy Potter if you can assist as a frog explainer, even for an hour. No experience required. Encourage your frog friends to join or donate to FATS. Donations help with the costs of frog rescue, student grants, research and advocacy. All expressions of opinion and information in FrogCall are published on the basis that they are not to be regarded as an official opinion of the FATS Committee, unless expressly so stated.

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FATS ON FACEBOOK: FATS has over 2,600 Facebook members from almost every continent. Posts vary from husbandry, disease and frog identification enquiries, to photos and posts about pets, gardens, wild frogs, research, new discoveries, jokes and habitats from all over the world. The page includes dozens of information files.
<https://www.facebook.com/groups/FATSNSW/>

RESCUED FROGS are at our meetings. Contact us if you wish to adopt a frog. A cash donation of \$30 - \$50 is required to cover care and feeding costs. Sorry we have no EFTPOS. FATS must sight your current amphibian licence. Licences can be obtained from NSW National Parks and Wildlife Service, Office of Environment and Heritage (link below). Please join FATS before adopting a frog. This can be done at the meeting. Most rescued frogs have not had a vet visit unless obviously ill. Please take you new, formerly wild pet to an experienced herp vet for an annual check-up and possible worming and/or antibiotics after adoption. Some vets offer discounts.

<http://www.environment.nsw.gov.au/wildlifelicences/GettingAnAmphibianKeepersLicence.htm>

FATS now has Student membership for \$ 20 annually with Electronic FrogCall (but no hard copy mail outs).
<https://www.fats.org.au/membership-form>



Thank you to the committee members, FrogCall supporters, talented meeting speakers, Frog-O-Graphic competition entrants, events participants and organisers David, Kathy and Harriet Potter, Sarah and Ryan Kershaw. The FrogCall articles, photos, media and webpage links, membership administration and envelope preparation are greatly appreciated. Special thanks to regular newsletter contributors, Robert Wall, George Madani, Jilli Streit, Karen & Arthur White, Andrew Nelson, Steve Weir, Michelle Toms, Josie Styles, Jodi Rowley, Wendy & Phillip Grimm and Marion Anstis. Have we forgotten someone?



FROGWATCH HELPLINE 0419 249 728

FATS COMMITTEE CONTACTS

FATS MAILING ADDRESS: P O Box 296 Rockdale NSW 2216

Arthur White	President	ph/fax (02) 9599 1161	larthur@tpg.com.au
Marion Anstis	Vice President	(02) 9456 1698	fropole@tpg.com.au
Punia Jeffery	Chairperson		puniamje@gmail.com
Jilli Streit	Secretary	02 95646237	jillistreit@yahoo.com
Karen White	Treasurer	ph/fax (02) 9599 1161	larthur@tpg.com.au
Phillip Grimm	Memberships, Website & Facebook Manager	(02) 9144 5600	phigrimm@gmail.com
Kathy Potter	Events Coordinator	0403 919 668	kathy@the-pottery.org
Robert Wall	Field Trips Convenor	(02) 9681 5308	rjw2008@live.com.au
David Potter	Frog Helpline Coordinator	0413 210 789	david@the-pottery.org
Monica Wangmann	Editor	0418 992 766	monicawangmann@gmail.com
General Committee members	Natalia Sabatino, Andre Rank and Vicki Deluca		

FATS FIELD TRIPS

29th - 31st March

Smiths Lake

Leaders: Karen and Arthur White

This fieldtrip is fully booked. We, of course, will be scheduling this popular fieldtrip next season! It's usually on twice a year with priority to those who have not joined us in the last few years.

This concludes our fieldtrips program for Spring and Summer 2018/19.

Our 2019/20 fieldtrips program re-commences in September 2019.

The poem below, was kindly shared with FATS by John Cann, who spoke at our December 2018 meeting.

Renay Gardam lives at "Wangaroo" homestead, one hour north of Hillston NSW. Wangaroo is on Cogie Creek about 570km west of Sydney and at an elevation of approximately 109m above sea level. The nearest more populous place is the town of Hillston, which is 59km away with a population of around 1,200.



A Welcome Visitor

The smell of rain provoked him
From underneath the ground
He had burrowed to the surface
Without making any sound

He was not a common visitor
But he was a welcome sight
As the farmers knew for sure
That there'd be some rain tonight

Renay Gardam