

# froglog

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News from the herpetological community

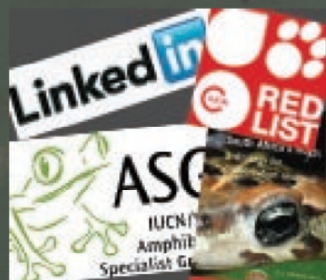
## Regional Focus Maritime Southeast Asia and Oceania



Spotted Treefrog *Nyctixalus pictus*. Photo: Leong Tzi Ming

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New  
Members'  
Bulletin  
Board



The 2012 Sabin  
Award for Amphibian  
Conservation is now  
open for nomination

# froglog

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# Biology and conservation of Fiji's iconic native amphibians

By Dr. Edward Narayan

**F**iji Island archipelago consists of 322 small islands located between 176° 53' east and 178° 12' west. There are two iconic amphibian species belonging to the genus *Platymantis* (Family Ranidae, subfamily Platymantines), while a third species *P. megabotoniviti* is extinct. The extinct Fiji frog, *P. megabotoniviti* is believed to have been hunted down to extinction by the first Fiji inhabitants and rats (*Rattus rattus* and *R. praetor*) that had come with them in the late Holocene. Also found in the Fiji archipelago is the non-native cane toad, *Rhinella marina*, which was introduced into Fiji in 1936 to control the insect pests in Fiji's sugar cane fields. Cane toads have been detrimental to native frog populations by preying upon frogs and froglets and competing for food and habitat space, especially with the Fijian ground frog (*P. vitiana*). The Fijian ground frog is currently listed as Endangered (EN B1 + 2C) while the Fijian tree frog (*P. vitiensis*) is listed as Near Threatened (NT) by the International Union for Conservation of Nature (IUCN).



Fijian ground frog (*Platymantis vitiana*). Photo: E. Narayan.



Edward Narayan collecting frog urine on Viwa Island. Photo: E. Narayan.

Over the past decade, research gaps were identified mainly in the knowledge of geographic distributions of native Fijian frogs because of incomplete surveys of several natural habitats. Therefore, more targeted herpetological surveys were undertaken by local scientists to uncover the distribution and abundance of native Fijian frogs. Presently the Fijian tree frog is restricted to four of the largest islands: Viti Levu, Vanua Levu, Taveuni, and Ovalau while the Fijian ground frog is present only on one small site (Waisali forest reserve) on Vanua Levu and four other small islands in the mid-parts of Fiji; Viwa Island in Tailevu; Ovalau and Gau in Lomaiviti group; and Taveuni. All of these four small islands are free of the invasive Small Asian Mongoose (*Herpestes javanicus*) and interestingly there are no cane toads present only on Gau Island. This could be a reason that ground frogs on Gau are much larger in size than their counterparts on other islands.

Recently, we have directed immense research focus on understanding the reproductive biology, breeding and physiological stress responses of native frogs within natural habitats, which aims to contribute new knowledge on species biology and species conservation. We studied the early developmental biology of *P. vitiana* revealing some unique embryonic features, especially the vascularised abdominal sacs that are used for respiration in the absence of a vascularised tail or gill arches (Narayan et al. 2011). We have also established non-invasive enzyme-immunoassays for assessing the reproductive hormonal cycles (Narayan et al. 2010a) and stress hormonal



Eye of the Fijian ground frog (*Platymantis vitiana*). Photo: E. Narayan.

responses (Narayan et al. 2010b) of Fijian ground frogs. These physiological tools can be used to rapidly track the reproductive cycles and the physiological responses of native frogs to anthropogenic changes such as climate change and disease (e.g. chytridiomycosis – a lethal disease caused by the fungal pathogen *Batrachochytrium dendrobatitis*, hereafter referred to as *Bd*). It can also be used for tracking the health status and well-being of native frogs in captivity. We have discovered that the Fijian ground frog population on Viwa Island is at present free of chytridiomycosis. We provided several hypotheses to explain this result such as; 1) hot weather all year round inhibiting the spread of *Bd*, 2) *Bd* may be absent from Viwa Island due to a lack of amphibian introductions (not introduced or importation of exotic frogs such as *Rana catesbeiana*, or *Xenopus* spp or pet trade spp) or 3) the lack of introduction by human vectors due to the geographic isolation, and low visitation of non-local people into the island (Narayan et al. 2011b).

It is crucial to have strong support of the local communities while conducting research in Fiji as they are the spiritual and traditional owners of the land and native fauna. Thus as part of our community based conservation research in Fiji, we have undertaken several projects that are managed by the local people themselves. We have a completed trial project to monitor the annual reproductive cycle of *P. vitiana* on Viwa Island through setting up of barriers to exclude the cane toads from ground frog

breeding sites (see: [http://www.ruffordsmallgrants.org/rsg/projects/edward\\_narayan](http://www.ruffordsmallgrants.org/rsg/projects/edward_narayan)). Currently, we have undertaken another project to eliminate cane toads from the breeding sites of Fijian ground frogs on Viwa Island. The outcome of this research will help to increase the breeding success of ground frogs and enhance population growth (See: [http://www.ruffordsmallgrants.org/rsg/projects/edward\\_narayan\\_1](http://www.ruffordsmallgrants.org/rsg/projects/edward_narayan_1)). We hope to replicate our projects on other islands with native frogs and promote the biodiversity conservation knowledge enhancement

of the local people. Together, we can work strongly towards saving our native herpetofauna in Fiji Islands.

*Author details: Dr. Edward Narayan, Postdoctoral Research Fellow, Griffith University, Australia. Email: e.narayan@griffith.edu.au*

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