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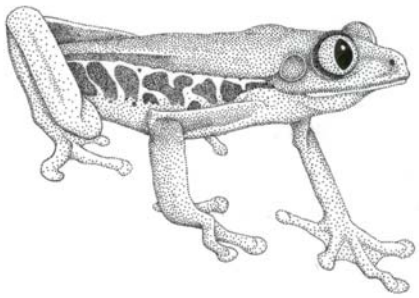
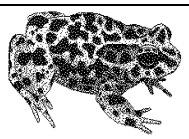


FROGLOG

Newsletter of the Declining Amphibian Populations Task Force

April 2005, Number 68



The DAPTF California / Nevada Working Group Annual Meeting

By David Bradford, Working Group Chair

The 13th annual meeting of the working group was held at the University of California, Berkeley, on January 13-14, 2005. Over 150 individuals attended, representing (in order of frequency): federal agencies, universities, environmental consulting firms, state agencies, independent parties, and non-governmental organizations. The meeting was sponsored by the California Biodiversity Centre of the University of California.

Two keynote presentations were given. Dr. David Wake, UC Berkeley, spoke on "Amphibian Declines: A 15-year Retrospective. Where Are We Heading?" This was an enlightening talk that included several perspectives on the value of biodiversity, using amphibians as examples; the history of recognition of the declining amphibian phenomenon; the many accomplishments resulting from this concern; and recent documentation for the magnitude of declines and the lack of understanding for many of them.

Dr. Tyrone Hayes, UC Berkeley, spoke on "From Silent Spring to Silent Night: Pesticides and What Our Canary is Trying to Tell Us." This was a stirring talk on the abundant evidence for adverse effects of the world's most heavily used pesticide, atrazine, on frog reproductive biology, and the resistance of the regulatory community to accept and act on these new findings.

Twenty-nine contributed talks and 5 posters reflected a variety of topics and species:

A. *Legal Actions*. In 2004, the US Fish and Wildlife Service (FWS) listed all population segments of the California tiger salamander (*Ambystoma californiense*) as endangered or threatened. Petitions or appeals are ongoing or likely to be submitted concerning the listing or critical habitat designation for 4 other amphibians: California red-legged frog (*Rana aurora draytonii*), mountain yellow-legged frog (*R. muscosa*), relict leopard frog (*R. onca*), and Siskiyou mountain salamander (*Plethodon stormi*). The US Environmental Protection Agency (EPA) was sued for not consulting with FWS about potential impacts of pesticides on the threatened red-legged frog. Subsequently, EPA issued new guidelines allowing it to use its own discretion in deciding whether to consult with FWS concerning endangered species. These guidelines are being challenged. A lawsuit against the California Department of Pesticide Regulation pertaining to potential effects of pesticides on amphibians has been "mooted" for technical reasons, but an appeal is ongoing. Several habitat conservation plans are under development or in progress that will affect a number of amphibians in California and Nevada.

B. *Factors Potentially Affecting Amphibian Populations.* Three papers addressed chytridiomycosis in the mountain yellow-legged frog in the Sierra Nevada Mountains. Topics included the sequence of events in the continued decimation of frog populations, the lack of evidence that the chytrid pathogen is able to survive when its amphibian host is absent, and the efficacy of using tadpole mouthparts to determine the chytrid status of frog populations. Two papers provided new correlative evidence that airborne pesticides are adversely affecting amphibian populations in the Sierra Nevada Mountains. Other presentations on impacts addressed the palatability of two native amphibians to introduced fish, Yosemite toad (*Bufo canorus*) and Pacific treefrog (*Pseudacris regilla*); influence of vegetation encroachment on populations of the Amargosa toad (*Bufo nelsoni*); video observations of crayfish predation on eggs of the foothill yellow-legged frog (*Rana boylii*); effects of wild fires and post-fire flooding on amphibian habitats in southern California; and the role of climate change in population declines of the foothill yellow-legged frog.

C. *Protection and Recovery Efforts.* Presentations by the California Department of Fish and Game (CDFG) and National Park Service showed remarkable recovery of populations of the mountain yellow-legged frog following removal of introduced fish. CDFG has developed a number of basin management plans that include restoration of native aquatic faunal assemblages. Other papers described the creation of new pond habitat for the Columbia spotted frog (*Rana luteiventris*); a remarkable comeback for the California red-legged frog in Calaveras County, home of the famous Mark Twain Jumping Frog Contest; management of habitat for the red-legged frog within the State Water Project facilities; and development of conservation strategies for five Sierra Nevada amphibians.

D. *Fundamental Biology.* A number of papers addressed various aspects of amphibian biology that are relevant to the protection or recovery of species. Included were studies on the seasonal movements, habitat variability, and mating system of the foothill yellow-legged frog; complementary resource use in the Cascades frog (*R. cascadae*); life history of post-metamorphic tailed frogs (*Ascaphus truei*); upland habitat use by the California tiger salamander; age structure and longevity of the mountain yellow-legged frog; influence of watershed-scale properties (especially forest cover) on stream temperature and the existence of the cold-water amphibians, tailed frog and southern torrent salamander (*Rhyacotriton variegatus*); and malformation and trematode parasitic infection in frogs.

E. *Population Status, Distribution, and Phylogeography*. Studies on two taxa, foothill and mountain yellow-legged frogs, provided detailed phylogenetic trees which should be helpful in identifying

natural dispersal corridors and appropriate geographic units for conservation. A population of the lowland leopard frog (*R. yavapaiensis*) has been found in Arizona in an area previously speculated to contain the relict leopard frog, a discovery that confounds plans for re-establishing new populations of the relict leopard frog in this area.

F. *Survey and Monitoring Programs*. CDFG has nearly completed a comprehensive survey of fish and amphibians in all bodies of water in the Sierra Nevada. The US forest Service has initiated a long-term monitoring program for status and change of populations and habitat for the mountain yellow-legged frog and Yosemite toad throughout the Sierra Nevada. The meeting agenda and abstracts are available at: **www.http://ice.ucdavis.edu/CANVDeclIningAmphibians**/. The 2006 annual meeting will be held on January 12-13 in Arcata, California.

Survival of an undescribed Atelopus from the Venezuelan Andes

By Juan Elías García-Pérez, UNELLEZ-Guanare

The genus *Atelopus* has caused concern among neotropical herpetologists and conservation biologists, because all described species are listed in the IUCN Red List Categories as Extinct or Critically Endangered (Lötters, *et al*., 2004). Once very abundant in the Cordillera de Mérida, these beautiful coloured frogs started an extinction race in the late 80´s (La Marca & Rheinthaler, 1991).

During December 8-12, 1987, a herpetological team from the Universidad de Los Andes collected 12 specimens of an undescribed species of the genus *Atelopus* in the margins of a permanent stream in Macizo de Guaramacal, in a partially isolated cloud forest in the northeastern section of the Cordillera de Mérida. This species, currently under description by La Marca (*pers. com.*), was temporally called *Atelopus* sp. 32 in an entire genus conservation status paper (La Marca, et al., *in press*), and appeared to have suffered from a population decline similar to other species of the same genus (Young *et al.* 2001; La Marca 2004; Manzanilla & La Marca 2004; Lötters *et al.* 2004).

Since 1987, no other adult individual of this species has been observed. However, in a monitoring study started in 1994, we documented at least four events of breeding activity of this species: 30 tadpoles and three recently metamorphosed juveniles in early 1995, one recently metamorphosed juvenile in October 1995 (García-Pérez, 1997), two tadpoles in February 2004 and 18 tadpoles in December 2004. Additionally, we recorded the advertisement call of a frog species in April 2002 and November 2004 that, because of its similarities with other members of the genus, I am confident belongs to the genus *Atelopus.*

Up to November 2004, I had only observed *Atelopus* specimens in a single mountain stream, with a 45 degree slope, causing concern about possible deleterious events due to flooding and landslides in the rainy season, as suggested by La Marca and Lötters (1997). I corroborated such changes in this stream several times in the course of this study, which removed and dragged soil, plants and possibly frogs, from the stream margins and subsequently impoverished the habitat.

Fortunately in December 2004, I found evidence of a second breeding population in a neighboring stream that had not suffered from flooding or changes from landslides and which had several suitable pools for *Atelopus* tadpoles. Although I did not hear any frog songs at this time, the presence of tadpoles indicated the survival of at least one reproductive pair, because all tadpoles were in the same larval stage.

The two breeding populations are found in a mainly pristine protected area (Guaramacal National Park). The only sign of environmental intervention is an unpaved dirt road, with limited access for four-wheel drive vehicles. The road is periodically maintained by removing soil caused by erosion and landslides during the rainy season. We found no evidence of introduced fish such as trout in either stream.

Three other anurans with free-living larvae were collected at the first stream in 1987 (García-Pérez, 1999). Since then, an unidentified Dendrobatid frog has been observed but not collected, as is the case with an unidentified Centrolenid frog and *Hyla jahni.* Nonetheless, one species of salamander, *Bolitoglossa guaramacalensis*, not collected in 1987, has been the most common species found near this stream since 1995.

The next steps will be to search for other suitable streams and continue weekly visual and sound monitoring in the known site where the species persists. This will involve the regional Instituto Nacional de Parques (INPARQUES), national park rangers, students, universities and NGO's.

I believe this is the only known breeding population of *Atelopus* in the Cordillera de Mérida, in the last ten years, because I found four tadpoles of *Atelopus* mucubajiensis in September 1994 (García-Pérez, 1997) but only those in Guaramacal showed true evidence of reproduction.

For more information please contact: **jegarciap@cantv.net**

Acknowledgements

I am indebted to the personnel of the Parque Nacional General Cruz Carrillo (Guaramacal) for the support they have given my undergraduate students and I. This study was partially granted by Asociación ECONATURA (a Venezuelan Conservation NGO) and UNELLEZ (Universidad Nacional Experimental de Los Llanos Occidentales Ezequiel Zamora) grant SEI 23194106. I am thankful to Enrique La Marca, who discovered the species and for his field companionship and scientific support.

References

García-Pérez, J.E. 1997. Evaluación del estado poblacional de dos especies de sapitos amenazadas de extinction: *Atelopus mucubajiensis* y *Atelopus* sp. (Anura: Bufonidae) Parque Nacional Sierra Nevada y Parque Nacional Páramo Guaramacal "General Cruz Carrillo", en los Andes venezolanos: resultados preliminares. In I. Novo, L. G. Morales, C.T. Rodríguez and G. Martínez (Eds.). Ciencia y conservación en el Sistema de Parques Nacionales de Venezuela, pp. 211–216. Caracas, Venezuela

García-Pérez, J. E. 1999. La Herpetofauna del Macizo de Guaramacal, *In* N. Cuello Ed. "Parque Nacional Guaramacal", pp 127-137.

La Marca, E. 2004. Der Rückgang von Froschpopulationen in den Hochanden Venezuelas. Reptilia: **46:** 34-38.

La Marca, E., & S. Lötters. 1997. Monitoring of declines Venezuelan *Atelopus*. Pp 207-213 *In* W. Böhme, W.Bischoff & T. Ziegler (eds). Herpetologia Bonnensis. Bonn, Germany.

La Marca, E., K. R. Lips, S. Lötters, R. Puschendorf, R. Ibáñez, J. V. Rueda-Almonacid, C. Marty, R. Schulte, F. Castro, J. Manzanilla-Puppo, J. E. García-Pérez, F. Bolaños, G. Chaves, J. A. Pounds, E. Toral & B. E. Young. (In Press). Catastrophic Population Declines and Extinctions in Neotropical Harlequin Frogs (Bufonidae: *Atelopus*). Biotropica

La Marca, E. & H. P. Rheinthaler. 1991. Population changes in *Atelopus* species of the Cordillera de Merida Venezuela. Herp. Rev. **22(4)**: 125-128.

Lötters, S., E. La Marca, S. Stuart, R. Gagliardo and M. Veith. 2004. A new dimension of Current Biodiversity loss? Herpetotropicos **1 (3)**: 29-31.

Manzanilla, J. & E. La Marca. 2004. Population status of the Rancho Grande harlequin frog (*Atelopus cruciger* Lichtenstein and Martens 1856), a proposed critically endangered species from the Venezuelan Coastal Range. Mem. Soc. Ci. Nat. La Salle, **62(157)**:5-29.

Young, B. E., K. R. Lips, J. K. Reaser, R. Ibañez, A. W. Salas, J. R. Cedeño, L. A. Coloma, S. Ron, E. La Marca, J. R.

Meyer, A. Muñoz, F. Bolaños, G. Chaves & D. Romo. 2001. Population Declines and Priorities for Amphibian Conservation in Latin America. Conservation Biology **15(5)**: 1213-1223.

No infectious disease in western Chinese stream salamanders

By Jinzhong Fu and Yuchi Zheng

Infectious diseases have been responsible for population declines in several Central American amphibian species (Berger et al., 1989). During a field trip to western China in May 2000, we first noticed lesion-like symptoms among individuals of the stream salamander *Batrachuperus pinchonii*, which coincided with an observed decline of the population size. The population was located at Hepinggou valley, Baoxing county of Sichuan Province (N30º39.323', E102º44.711'). One adult and one juvenile were discovered from a stretch of approximately 60 meters of the valley. The adult specimen had a lesion-like skin infection and the juvenile appeared to be normal. The small population size is in strong contrast to the healthy and large population that we observed in the previous year. In May 1999, 17 adults were collected from a stretch of approximately 30 meters of the same location, where all specimens appeared to be normal and healthy. We suspected that the infection was the cause of the apparent population decline, and subsequently, with support from the Declining Amphibian Populations Task Force (DAPTF), we conducted a field experiment to determine whether the pathogen was transmitted by water and/or substrates. We also tried to identify the possible pathogens, in collaboration with other pathologists.

Description of symptoms. The suspected infection appears to be a skin lesion. It occurs on the back and sides of the body, and is more concentrated on the sides of the trunk and the base of the tail. The lesions are white in colour, contrasting against the normal blackish or brownish skin, and appear to be softer than normal skin and slightly swollen. The lesions do not appear to limit the animal's movements, even where the lesions are more extensive.

Infection experiments. Four mesh cages made of mosquito net and measuring approximately 1m x 1m x 30cm were placed in Hepinggou valley where the infected salamanders were discovered. The cages were half submerged by using substrate from the bottom of the stream within each cage Twenty healthy salamanders were collected from Sanchagou, Baoxing County (N30°34' E102°57') and five specimens were released into each cage. Both Hepinggou and Sanchagou streams are connected to the same major river, Donghe, and are located on different sides of the major river. Sanchagou valley is approximately 20 km downstream from Hepinggou. All guidelines recommended by the DAPTF were followed to prevent unintended infection by researchers.

The cages were set up in June 14, 2001. Three checks were conducted on 18th of June, 4th of July, and 3rd of August. The first check found two individuals from cage #1 and one individual from cage #3 with cloudy white spots of the side of the trunk, seemingly at an early stage of the infection. The second check found two individuals from cage 1 (presumably the same two) and two from cage #3 with what appeared to be similar early symptoms of the infection. One individual from cage #4 died. The last check found one individual with a questionable infection in cage #1. No individuals from cage #2, 3 and 4 showed any more cases of infection, and the cloudy white spots initially manifested on the above specimens disappeared. All specimens used in the experiment were preserved at Chengdu Institute of Biology.

From our experiment, we tentatively conclude that the primary transmission medium of the potential pathogen is not water or substrate, although this possibility cannot be ruled out. Our experimental period may have been too short for the specimens to develop diagnosable infections.

Identification of the pathogens. The attempt to identify the pathogen proved to be challenging. A test for Chytrid fungus was found to be negative, courtesy of Dr. Jean-Marc Hero. A subsequent examination at the Canadian Cooperative Wildlife Health Centre at the University of Guelph also failed to reveal the possible pathogen. No bacterial growth was recovered from the frozen sample of "infected" skin. Histological examination of the eyes, brain, oral cavity, stomach, liver, spleen, pancreas, small intestine, and kidney revealed no lesions. The only observed histological abnormality of the skin cells were an abnormal number of pyknotic nuclei in the superficial layers of the epithelial cells. At the present time, we do not know what pathogens caused the infection, although we can rule out chytrid fungus and bacteria.

We also surveyed the area surrounding the site. As there were no farms upstream, we believe that there was no chemical fertilizer, pesticide or herbicide contamination. Our continuous field survey suggests that the disease may not be the cause of the population decline in 2000. During 2001, a large population at the location was observed, although a large number of the individuals (approximately 1/3) were infected. The long-term cause and effect of the infection remains unclear. Furthermore, this disease may not be restricted to salamanders, as local people have reported similar symptoms from time to time in the fish *Schizothorax sp.*

In summary, the lesion- causing disease appears not to be infectious. The cause of the lesion is unclear, although chytrid fungus and bacteria have been ruled out. We will continue to monitor the population and determine the potential long term effect of this disease on the population.

Acknowledgements

We would like to thank Dr. Jean-Marc Hero for helping with the Chytrid fungus test and Dr. Doug Campbell for performing other pathogen identification.

References

Berger, L., R. Speare, P. Daszak, D. E. Green, A. A. Cunningham, C. L. Goggin, R. Slocombe, M. A. Ragan, A. D. Hyatt, K. R. MacDonald, H. B. Hines, K. R. Lips, G. Marantelli, and H. Parkes. 1998. Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. **PNAS 95:** 9031-9036.

PROJECT KODOK 2005

By Rachel Furlong, Cheryl Gibbons, Kate Kennedy, Ian MacKenzie, Sam Shonleben and Amelia Stott

Project Kodok is a student-run research programme aimed at contributing to the understanding of global amphibian declines through the study of anuran populations in the tropical forests of Borneo, South East Asia. A team of six members will spend approximately two months conducting a comprehensive monitoring survey of anuran populations, during the summer of 2005. We aim to produce a comprehensive list of Anuran species which we can then use to conduct monitoring surveys to assess their abundance and distribution. Project Kodok is planned to be a five-year study in Borneo, this expedition being the first phase. Project Kodok is working in collaboration with DAPTF, so that our findings can be available to others, in order to contribute to the worldwide effort in conserving these ecologically important, yet vulnerable organisms.

The project will take place in Tanjung Puting National Park, Central Kalimantan, Indonesian Borneo. Camp Leakey Research Station, run by The Orangutan Foundation International, will serve as our base. No amphibian surveying or monitoring has been done previously in the park. Under threat from illegal logging, gold mining and forest clearance for palm oil plantation, the park represents an important area of Indonesian biodiversity. There is a need to record and monitor this biodiversity before it is too late. The park, a lowland area of tropical heath swamp forest, may well harbour many species of amphibians previously only known from other well-studied areas of the Island. A

small preliminary investigation identified six species from the immediate vicinity of the camp itself, one of which has not previously been recorded from Kalimantan (Shonleben, in press). It is the hope and one of the main aims of the project that such biodiversity data for biologically sensitive indicator species such as frogs and toads could provide ammunition for further protection and legislation for the park. Such a goal will benefit all the organisms that form such a complex ecosystem.

The second aim of the Project is to record abundance data for as many vocalising and non-vocalising species as possible. It is universally acknowledged that global amphibian populations are in decline to such a serious extent that many species have become extinct, or have become at very high risk of extinction, in the recent past. This trend is continuing, and is even more alarming because declines have been detected in populations living in pristine habitats, not just those in disturbed or shrinking habitats. It is therefore imperative for research on amphibian populations to be conducted, so that a better understanding of their decline can be achieved, and hence that conservation efforts towards preserving this diverse and ecologically important group of organisms can be effective. It is hoped that Project Kodok will provide abundance data on an annual basis for at least five years. Our methods follow those of Project Anuran, a multi-species monitoring programme in Belize, Central America (See Gardner and Fitzherbert, 2001, also **www.projectanuran.org**), that uses non-invasive census techniques, including the utilisation of the male advertisement call. The relative abundance index used in Belize in turn follows the protocol of The Maya Forest Anuran Monitoring Program (MAYAMON), an internationally funded monitoring project of the entire Central American Maya Forest Region (see www.mayamon.org). Such abundance data are adequate to detect pronounced population trends (see papers by Jim Arrigoni, downloadable from the MAYAMON website). The continued use of a standard protocol will facilitate comparison between different sites cross the globe. Our data will be forwarded to the DAPTF database of anuran species in South – East Asia.

The proposal, the preliminary report and the final full project report will be available as a free download from the project web site (**www.projectkodok.org** – up and running in the near future). A summary paper will also be submitted to The British Herpetological Society publication The Herpetological Bulletin. In addition to this, an abridged copy of the report will be sent to local education institutions in Borneo. The aim of this is to increase the awareness of local people of the species that they are surrounded by and the benefit conservation can bring to them. A similar interactive document aimed at high school pupils will be published on the project's web site. This will provide free access to the full reports and more general anuran information; it will also be linked to other anuran studies and function as a learning and teaching resource. If possible this will be translated into Indonesian to aid local education. We also hope to involve Indonesian students in our project. For more information please e-mail: **projectkodok@hotmail.com**

References

Gardner, T. and E. Fitzherbert (2001). Project Anuran: A Multi – species monitoring project at the tropical lowland forest site of Las Cuevas, Chiquibil Forest Reserve, Belize. Herpetological Bulletin 78, pp: 7-15.

Shonleben, S. (In Press). Preliminary Notes on Amphibian Fauna of Tanjung Puting National Park, Central Kalimantan, Indonesian Borneo

Reports on DAPTF Seed Grants

Recipients of DAPTF Seed Grants are generally expected to publish the results of their projects in refereed journals, or as articles in *Froglog*. They are also required to send us reports, so that their results can be made available to DAPTF members. Below is a list of reports that we have received recently. Anyone wanting a copy of a report should contact the author in the first instance; we can supply copies if you cannot reach the author.

Pamela D. Widder & Joseph R. Bidwell (2004) Laboratory and mecocosm evaluations of cholinesterase activity and behavior in chlorpyrifos exposed *Rana sphenocephala* tadpoles. (**pamela.widder@okstate.edu**)

Books Received

By Tim Halliday

• Colburn, E. A. (2004) *Vernal Pools: Natural History and Conservation.* McDonald & Woodward Publishing Co., Blacksburg, Virginia. (426 pp.)

This comprehensive and meticulously-researched book is based on the author's extensive work on ephemeral pools in eastern North America. Every aspect of pond hydrology and chemistry is covered, together with detailed accounts of all components of flora and fauna. A chapter is devoted to amphibians. This is an invaluable handbook for anyone setting out to work on neglected, fragile ephemeral ponds and, most importantly, to conserve them.

• Marian Van Eyk McCain (2004) The *Lilypad List: 7 steps to the simple life.* Findhorn Press, Scotland. (182 pp.)

The author of this book, a psychotherapist, has generously given royalties on its sale to the DAPTF. It examines life in a pond, particularly that of frogs, and presents it as a metaphor for people seeking a simpler and more satisfying lifestyle.

• Young, B. E., Stuart, S. N., Chanson, J. S., Cox, N. A. & Boucher, T. M. (2004) *Disappearing Jewels: The Status of New World Amphibians. / Joyas que Están Desapareciendo: El Estado de los Anfibios en el Nuevo Mundo.* NatureServe, Arlington, Virginia. (54 pp.)

This attractively-illustrated, large-format booklet presents the results of the IUCN Global Amphibian Assessment (GAA) for the New World. Aimed at a wide audience, it provides a good overview, not only of the current status of amphibians in the Americas, but also of the causes of global amphibian declines. It concludes with a section on conservation, an agenda for the future.

Froglog Shorts

DONATIONS We gratefully acknowledge receipt of the following donations received prior to April 2, 2005. ***Institutions:*** Durrell Wildlife Conservation Trust, Central Illinois Herpetological Society and the Columbus Zoo and Aquarium. ***Individuals:*** Douglas K. Holmes, Anthony Russel, Jerry Johnson, Chris Banks , Yi Ju Yang, Janalee P. Caldwell, Merrill Taws, Richard C. Bruce and Anonymous X 2.

A special welcome to our new Regional Working Group Co-Chair for S.Korea:

Dr. Daesik Park

Owen Stephens, SOC offers his services to anyone in the herpetological world who is making a film or video and requires a director/cameraman. Contact him at: **owen@pampalite.com**

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FROGLOG is the bi-monthly newsletter of the Declining Amphibian Populations Task Force. *Articles on any subject relevant to the understanding of amphibian declines should be sent to:* Jeanne McKay, Editor, Department of Biological Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, U.K.
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