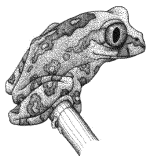
Agalychnis callidryas by Tim Halliday ISSN 1026-0269

FROGLOG

Newsletter of the Declining Amphibian Populations Task Force

June 2001, Number 45.



Contemporary Conservation Considerations for Nigerian Amphibians

By G.C. Akani & L. Luiselli,
DAPTF Nigeria
g.c.akani@usa.net
lucamlu@tin.it

Over the years, Nigeria has been experiencing a dramatic rise in its human population and presently has a population figure close to 100 million. There is also a large increase in land use, particularly by the oil industry and project developers. This has led to an incredible loss of various habitats. The most catastrophic effects are noticeable in the southern wetlands of the Niger Delta, Akwa Ibom State and Cross River State, where the bulk of oil industries and development projects are concentrated, and where the only remaining rainforest patches occur. Since most amphibian biodiversity is restricted to these wetland regions, it should be expected that this enormous loss of amphibian habitat is adversely affecting populations.

Since 1996, we have embarked on ecological research on the herpetofauna of Nigeria with a special focus on rainforest species. Now, the first step of our research as DAPTF working group for Nigeria is to produce an elaborate checklist of the Amphibian fauna of Nigeria site-by-site. Secondly, we intend to determine areas which are especially crucial for conservation of the amphibian fauna.

During the course of our various ecological surveys, we were able to identify some forest reserves which appear to harbour an abundant amphibian fauna, including, for example, the goliath frog and several hyperoliid species. These forests include: gallery forests around the Rivers Orashi, Sombreiro and Otamiri, the coastal barrier forests of Peterside and Bonny and Taylors Creek - all in Rivers State, Stubbs Creek Reserve in Akwa Ibom State, and a series of seasonal rainforest swamps of Bayelsa and Delta States, plus the Cross River National Park and Iko-Esai Forest north of Calabar (Cross River State).

As a means of sampling the amphibian fauna of many localities, a network has been organized in various universities which includes several research students. Further details on the results obtained will be presented to the DAPTF as soon as available.

The DAPTF Captive Breeding Working Group

In an effort to save some threatened species from the brink of extinction it is often necessary to rely upon captive breeding initiatives. The role and importance of captive breeding in amphibian conservation is increasing, with many zoological institutions and professional individuals throughout the world initiating and participating in programmes aimed at combating critical amphibian population declines.

One example of such an initiative can be seen at The Manchester Museum, England, where probably the most important collection of phyllomedusine frogs is being maintained. Andrew Gray, The Curator of Herpetology at Manchester University, has developed the collection over several years, during studies aimed at gaining a fuller understanding of the various species' breeding biology and behaviour. When maintaining breeding groups, it is vital to try and understand the dynamics involved, and through the correct assessment of species' requirements the welfare and breeding success of endangered species can be optimized. The frog collection at Manchester is maintained in a purpose-built facility where they have the expertise to keep and breed several species that are considered by many as being almost impossible to maintain in captivity. The main aim in utilizing and developing this collection is now firmly focused on captive breeding for conservation purposes. Notable success has recently been achieved with *Phyllomedusa lemur* and *Agalychnis calcarifer,* two neotropical species which are presently considered as being rare and under threat of extinction. Here, a healthy self-sustaining population of each species is being established in an effort to provide a safety net and develop husbandry guidelines for the future.

It is well recognized that many institutions and professional individuals are working on similar initiatives, developing the skills required to maintain and breed specific groups or species of amphibian. The DAPTF Captive Breeding Working Group is being formed in an effort to support these and, in bringing them together, develop further initiatives to help other threatened species. It is proposed that support by the group should take several forms, including the provision of assistance with species management, the networking of information, and in recommending direct DAPTF assistance for new or struggling initiatives. Based on current information, provided by DAPTF representatives working in the field, the CBG may also be actively involved in proposing species that require future captive management.

In establishing the DAPTF Captive Breeding Working Group, we ask that all institutions or professional individuals interested in participating first contact Andrew Gray at The Manchester Museum. Andrew is coordinating the formation of this group and collating information on possible participants. Please provide a brief introduction to your collection, highlighting your experience with specific groups and/or the endangered species you are presently/intending working with. Andrew will be producing a full inventory of captive

specimens held by participating members of the group, and will forward a relevant questionnaire by return. He has also offered to host the first DAPTF Captive Breeding Working Group meeting at The Manchester Museum, England in 2002.

Contact: Andrew Gray, Curator of Herpetology, The Manchester Museum, Oxford Road, Manchester, M13 9PL, United Kingdom.
andrew.gray@man.ac.uk

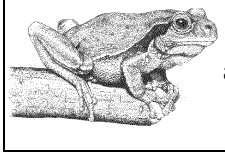
Limb Deformities in the Marine Toad in Peru and Bermuda

By Donald W. Linzey <WCLINZD@wc.cc.va.us>, Jamie P. Bacon, and Juanita B. Linzey

During the period December 24-29, 2000, a total of 111 marine toads (*Bufo marinus*) were examined for deformities in the Amazonas region of Peru. Toads were collected by hand from three sites: Site #1 - the Yanamono River near its confluence with the Amazon River, approximately 80 km down the Amazon River from Iquitos, Peru; Site #2 - the Sucusari River near its confluence with the Napo River, approximately 160 km from Iquitos and 80 km from Site #1; and Site #3 - approximately 2 km upstream from site #2 along the Sucusari River at the site of the Amazon Center for Environmental Education and Research (ACEER). The toads had a mean snout-vent length of 99.7 mm (range 65 to 190 mm).

Eight of the 111 toads (7%) exhibited limb deformities. The deformities involved the right rear limb (4), left rear limb (2), and right front limb (2). This deformity rate is significantly less than the 19% deformity rate recorded in Bermuda (139 out of 726 subadult and adult toads; mean snout-vent length = 122.4 mm, range 62 to 180 mm) between October, 1999 and September, 2000 as part of our long-term study of Bermuda's declining amphibian populations (Test and CI Interval for Two Proportions, p = 0.0001).

Detailed analyses, comparisons, and photographs of deformities from subadult and adult toads from Peru and from adult, subadult and newly-transformed toads from Bermuda are contained in a paper being prepared for publication.



Amphibian Status in Serbia and Montenegro (FR Yugoslavia)

By Milos Kalezic & Georg Dzukic, DAPTF Serbia & Montenegro

Serbia and Montenegro include such diverse landscapes as the Panonian lowlands, the mountainous biomes of the central parts, and the sub-Mediterranean and Mediterranean karst habitats of the Dinaric Alps in the South. The batrachofauna is particularly important because of its species richness, bio-geographical features, relict and endemic forms, and the presence of biological phenomena such as a high incidence of paedomorphosis in newt species (Dzukic et al. 1990).

At least 17 species occur. Of the two salamander species, the fire salamander (*Salamandra salamandra*) is widespread in mesophilic climatic areas, while the alpine salamander (*S. atra*) is restricted to Prokletije Mount with a highly patchy distribution pattern. *Salamandra atra* is endangered and extremely rare here. The most common newt is the smooth newt (*Triturus vulgaris*) with three subspecies, of which one is endemic (*T. v. tomasinii*, Krizmanic et al. 1997). The alpine newt (*T. alpestris*) originated on the Balkan Peninsula and is fairly well distributed in hilly and mountainous areas. As it now stands, *T. alpestris* is present with at least two subspecies of which *T. a. serdarus*, a highly endangered taxon, is endemic. In Serbia the ranges of all four crested newt species (*T. cristatus, T. dobrogicus, T. carnifex macedonicus* and *T. karelinii arntzeni*) come into contact, and their parapatric distribution patterns, interspecific hybridization and introgression events, as well as their phylogeny, still remain a puzzle in current batrachology (e.g. Kalezic et al. 1997, Crnobrnja et al. 1997). Habitat for the crested newts is dramatically decreasing, especially for *T. dobrogicus* and *T. cristatus* in Serbia, and of *T. carnifex* in Montenegro. The only real cryptobiont of the Balkans, the olm (*Proteus anguinus*), has not yet been recorded by specialists in the western parts of Montenegro despite considerable anecdotal evidence of its presence.

Compared to the tailed amphibians, anurans are much less well-known in terms of distribution, ecology, life-history, taxonomy, evolution, conservation status, etc. The fire-bellied toad (*Bombina bombina*) extends its range along the river Morava into the south, hybridizing with the yellow-bellied toad (*B. variegata variegata*) along its zone of contact. The taxonomic status of the more southern *B. variegata*-like taxon, named *scabra*, is still controversial, with the prevailing opinion that it is a separate species. Only a rather coarse picture has been obtained of the distribution patterns of two spadefoot species (*Pelobates fuscus* and *P. syriacus*) in the area in question. One of their zones of sympatry occurs in a very small part of Serbia. *Pelobates syriacus* is extremely rare in most of Serbia. Two toad species (*Bufo bufo* and *B. viridis*), as well as the tree frog (*Hyla arborea*), the agile frog (*Rana dalmatina*), and to a lesser extent the stream frog (*Rana graeca*), have a widespread distribution. However, the grass frog (*Rana temporaria*) can be found only sporadically in high mountains and, due to its fragmented range, can be considered a vulnerable species. It also seems that there are cryptic taxa within the *R. temporaria* species. The presence of the moor frog (*R. arvalis*) in Serbia is still uncertain. We do not know much about the distribution and especially the population structure of the green frog complex (*Rana ridibunda, R. lessonae, R.* kl. *esculenta*) in FR Yugoslavia. Another green frog species (*R. shqiperica*), from the Skadar Lake area, is poorly known, including its taxonomic status (it has been mostly considered a separate species, but also as *R. balcanica*, or even as *R. lessonae*).

The decline and local extinction of many amphibian species has been noted in the area in question for several reasons. With regard to global climatic changes, it seems that amphibians from Serbia are affected by long-term prolonged droughts much more than by increasing average temperature. Unfortunately, droughts have occurred mostly in wetland areas. The general anthropogenic factors detrimental to amphibian populations are as follows: acid precipitation, pesticide release, deforestation, land use change (e.g. urbanization, extension of agriculture to wetlands), habitat fragmentation, introduction of predator species, road kills due to increasing vehicle traffic, harvesting by humans, etc. These

factors act mostly on the amphibians of the Pannonian plain, as well as along the main river valleys (for example about one million and 55,500 hectares of wetland in Vojvodina and the Morava River basin have been drained, respectively).

In addition, the amphibians of Serbia, and to a lesser extent of Montenegro, face specific accident-related events with extremely detrimental and potentially long-lasting effects, causing a decrease in species richness and population size in some areas. During the 1999 NATO bombing, among the selected industrial sites that were targeted were those within several national parks and protected natural areas, and terrestrial and aquatic habitats were directly and indirectly exposed to negative physical, radiological and chemical effects (Krizmanic & Dzukic 1999). At the beginning of 2000, huge pollution of the rivers Tisa and Danube occurred due to the accidental release of 100,000 m^3 of wastes accumulated in deposited soil from the Baia Mara gold mine. The main pollutants were cyanide and several heavy metals. Less dramatic accidents seem to have affected rivers coming from Rumania and Hungary on several occasions during the last ten years. Bearing in mind all these dangers, further rather severe devastation of the amphibian populations in the area in question may be expected in the coming years.

To sum up, due to political instability, long-lasting serious economic problems and the widespread absence of public awareness of the importance of nature preservation and conservation matters, the amphibians in Serbia and Montenegro are continuously under the pressure of many detrimental factors which are specific in comparison with most European countries. Therefore, besides many other activities (protecting authentic, natural habitats, especially fragile ecosystems, creating new breeding sites by flooding depressions, establishing wet meadows and permanent forests, especially mixed forests), there is an urgent need to outline special protected zones, so that ecosystems are not badly treated or disturbed. In addition to already existing national parks and similar facilities, special biogenetic reserves for groups of species should be established, above all on Prokletije Mount, one of the primary biodiversity hotspots of Europe.

In fact, we claim that the importance of the Balkan batrachofauna in general has never really been understood, either in Europe or globally. Unfortunately, the problem of an effective conservation policy appears to be the criteria employed. They are neither standardized nor widely used, sometimes contradictory views are held, and there are local "colourings". These weaknesses are present even in the more important international documents intended to protect biodiversity (e.g. see Corbett 1989). The most developed countries, where these documents are created, tend to overestimate their own taxa and underestimate the "foreign" batrachofaunas. It seems a paradox that many taxa widely distributed throughout the Balkan Peninsula, including Serbia and Montenegro, have a special protected status (e.g. *B. bombina, B. variegata, B. viridis, R. dalmatina*), while the scientifically highly valuable stenoendemites, faunistic rarities and endangered taxa are neglected (e.g. *R. graeca, R. shqiperica*). We do not intend to establish general criteria here, and we do not think that we are objective while evaluating Balkan fauna, but we are sure that different opinions are needed in order to make justified valuations.

All amphibian species in Serbia and Montenegro, except green frogs, are protected by law. The harvesting of green frogs for the purpose of trade is regulated under a separate law. A Red List of Endangered Amphibians exists only for Serbia and includes all existing species. A list of endangered species in FR Yugoslavia considered to be of international importance, evaluated according to IUCN categories and criteria, is presented in Dzukic (1995). The legal regulation of the protection of amphibian species differs somewhat between Serbia and Montenegro. Generally speaking, however, the laws are in accordance with European standards, but their main weakness is the high annual sampling quota of green frogs, as well as the implementation of the law.

Contact: Dr. Georg Dzukic, Institute for Biological Research “Sinisa Stankovic”, 29 Novembar 142, 11060 Belgrade, FR Yugoslavia. **georg@ibiss.bg.ac.yu**

References

Corbett, K. (1989). The Conservation of European Reptiles and Amphibians. *Christopher Helm, London.*

Crnobrnja-Isailovic J., Dzukic, G., Krstic, N. & Kalezic, M.L. (1997). Evolutionary and paleogeographical effects on the distribution of the *Triturus cristatus* superspecies in the central Balkans. *Amphibia-Reptilia*, **18:** 321-332.

Dzukic, G., Kalezic, M.L., Tvrtkovic, N. &. Djorovic, A. (1990). An overview of the occurrence of paedomorphosis in Yugoslav newt (*Triturus*, Salamandridae) populations. Bulletin of the British Herpetological Society **34:** 16-22.

Dzukic, G. (1995). Diversity of Amphibians and Reptiles in Yugoslavia, with a survey of internationally important species. In: *Biodiversity of Yugoslavia with a survey of internationaly important species.* V. Stevanovic & V. Vasic (eds.), pp. 447-470. Faculty of Biology and Ecolibri, Belgrade. (In Serbian)

Kalezic, M.L., Dzukic, G., Mesaros, G. & Crnobrnja-Isailovic, J. (1997). The crested newt (*Triturus cristatus* superspecies) in ex-Yugoslavia: morphological structuring and distribution patterns. *University Thoughts, Pristina* **4:** 39-46.

Krizmanic, I., Mesaros, G., Dzukic, G. & Kalezic, M.L. (1997). Morphology of the smooth newt (*Triturus vulgaris*) in former Yugoslavia: taxonomical implications and distribution patterns. *Acta Zoologica Academiae Scientiarum Hungaricae* **43:** 345-357.

Krizmanic, I. & Dzukic, G. (1999). Herpetofauna of FR Yugoslavia after NATO aggression. *10th Ordinary General Meeting of Societas Europaea Herpetologica, Natural History Museum of Crete, Iraklion, September 6-10. Programme and Book of Abstracts,* p. 215.

Froglog Shorts

What lakes are of global significance to amphibian conservation? LakeNet, a global network committed to the conservation and sustainable management of lakes, seeks to incorporate amphibian conservation into its "Priority Lakes for Global Conservation" framework. Anyone with data on lakes key to amphibian biodiversity please contact Laurie Duker at:
Laurieduker@ monitorinternational. org
We are particularly interested in the names and locations of lakes that are known to serve as habitat for endemic or rare species We invite you to visit our website at:
http://www.worldlakes.org

Details of the United Nations Development Programme Small Grants Scheme for projects in certain developing countries are available at **http://www.undp.org/sgp/**
Working Group Chairs and others considering such projects take note! Funds are available for projects costing up to $50,000.

DONATIONS We gratefully acknowledge receipt of these donations, received 17 January – 29 May 2001. **Individuals:** Raymond Adams, Dinah Bear, Ellin Beltz, Robert Bernstein, Charles & Mary Carpenter, Rebecca Christoffel,

Beth Churchwell, Richard W. Clark, Jeffrey Corser, Paul M. Daniel, Ted Davis, William P. Davis, Michael Dloogatch, Gregory S. Eaglin, Sharon B. Emerson, Eugenia S. Farrar, Oscar Flores-Villela, Peter E. Graf, Phillip Greenberg, John A. Hall, Benjamin Hammett, Kurt A. Henkel, Hans-Werner Herrmann, Robert Parker Hodge, Jan Hoover, Karen L. Jacobs, Elliott R. Jacobson, Terrance R. Jaworski, Mark R. Jennings, Terry D. Keiser, Michael Lambert, Michael J. Lodato, Matthew E. Mickiewicz, David Money, John C. Murphy, Ryan W. McCue, Christopher J. Norment, Stephane Ostrowski, William S. Parker, Lona Pierce, James E. Platz, A. Stanley Rand, Alan Resetar, Lawrence P & Christina M. Richards, David Michael Sever, Richard Spieler, David Ross Spildie, Robert C. Stebbins, Terri Roth, Max Sparreboom, Raymond Stein, Glenn R. Stewart, Margaret M. Stewart, Merrill Tawse, Linda T. Torp, Doug & Karen Trachsel, Kent Vanooy, Edward J. Victoria Jr., William Westrate

Organizations: Chris Banks/ Melbourne Wholesale, Columbus Zoological Park Association/ Curatorial Staff, The Geraldine R. Dodge Foundation, San Antonio Zoo, San Francisco Zoological Society, Sedgwick County Zoological Society, Television for the Environment, Tulsa Zoo Conservation Committee, Zoological Society of Philadelphia, The Wallis Foundation.

Publications of Interest

Bardsley, L. & Beebee, T.J.C. (2001) Strength and mechanisms of competition between common and endangered anurans. *Ecol. Applications* **11:** 453-463.

Beebee, T. & Rowe, G. (2001) Application of genetic bottleneck testing to the investigation of amphibian declines: a case study with natterjack toads. *Conservation Biol.* **15:** 266-270.

Boone, M.D. & Semlitsch, R.D. (2001)Interactions of an insecticide with larval density and predation in experimental amphibian communities. *Conservation Biol.* **15:** 228-238.

Cooke, A.S. (2000) Monitoring a population of common toads (*Bufo bufo*) in a housing development. *Herpetol. Bull.* **74:** 12-15.

Davidson, C., Shaffer, H.B. & Jennings, M.R. (2001) Declines of the California red-legged frog: climate, UV-B, habitat, and pesticides hypotheses. *Ecol. Applications.* **11:** 464-479.

Green, D.E. & Kagarise Sherman, C. (2001) Diagnostic histological findings in Yosemite toads (*Bufo canorus*) from a die-off in the 1970s. *J. Herpetol.* **35:** 92-103.

Greenberg, C.H. (2001) Spatio-temporal dynamics of pond use and recruitment in Florida gopher frogs (*Rana capito aesopus*). *J. Herpetol.* **35:** 74-85.

Hels, T. & Buchwald, E. (2001) The effect of road kills on amphibian populations. *Biol. Conservation* **99:** 331-340.

Holmes, E.E. (2001) Estimating risks in declining populations with poor data. *PNAS* **98:** 5072-5077.

Holyoake, A., Waldman, B. & Gemmell, N.J. (2001) Determining the species status of one of the world's rarest frogs: a conservation dilemma. *Animal Conservation* **4:** 29-35.

Jansen, K.P., Summers, A.P. & Delis, P.R. (2001) Spadefoot toads (*Scaphiopus holbrookii holbrookii*) in an urban landscape: effects of nonnatural substrates on burrowing in adults and juveniles. *J. Herpetol.* **35:** 141-145.

Joly, P., Miaud, C., Lehmann, A. & Grolet, O. (2001) Habitat matrix effects on pond occupancy in newts. *Conservation Biol.* **15:** 239-248.

Kiesecker, J.M., Blaustein, A.R. & Belden, L.K. (2001) Complex causes of amphibian population declines. *Nature* **410:** 681-684.

Marco, A., Cash., Belden, L.K. & Blaustein, A.R. (2001) Sensitivity to urea fertilization in three amphibian species. *Arch. Environ. Contam. Toxicol.* **40:** 406-409.

Marco, A., Lizana, M., Alvarez, A. & Blaustein, A.R. (2001) Egg-wrapping behaviour protects newt embryos from UV radiation. *Anim. Behav.* **61:** 639-644.

Marsh, D.M. & Trenham, P.C. (2001)Metapopulation dynamics and amphibian conservation. *Conservation Biol.* **15:** 40-49.

Mazerolle, M.J. (2001) Amphibian activity, movement patterns, and body size in fragmented peat pogs. *J. Herpetol.* **35:** 13-20.

Nyström, P., Svensson, O., Lardner, B., Brönmark, C. & Granéli, W. (2001) The influence of multiple introduced predators on a littoral pond community. *Ecology* **82:** 1023-1039.

Parris, K.M. (2001) Distribution, habitat requirements and conservation of the cascade treefrog (*Litoria pearsoniana*, Anura: Hylidae). *Biol. Conservation* **99:** 285-292.

Pauli, B.D., Perrault, J.A. & Money, S.L. (2000) A database of reptile and amphibian toxicology literature. Technical Report Series No. 357E, Canadian Wildlife Service, Hull, Quebec, Canada. **http://www.cws-scf.ec.gc.ca/pub/tr/tech357/index_e.htm**

Petranka, J.W. & Murray, S.S. (2001) Effectiveness of removal sampling for determining salamander density and biomass: a case study in an Appalachian streamside community. *J. Herpetol.* **35:** 36-44.

Pounds, J.A. (2001) Climate and amphibian decline. *Nature* **410:** 639-640.

Rodda, G.H., Campbell, E.W. & Fritts, T.H. (2001) A high validity census technique for herpetofaunal assemblages. *Herpetol Rev.* **32:** 24-30.

Rowe, C.L., Hopkins, W.A. & Coffman, V.R. (2001) Failed recruitment of southern toads (*Bufo terrestris*) in a trace element-contaminated breeding habitat: direct and indirect effects that may lead to a local population sink. *Arch. Environ. Contam. Toxicol.* **40:** 399-405.

Salvidio, S. (2001) Estimating terrestrial salamander abundance in different habitats: efficiency of temporary removal methods. *Herpetol. Rev.* **32:** 21-24.

Sparling, D.W., Linder, G. & Bishop, C.A. (Eds.) (2000) *Ecotoxicology of Amphibians and Reptiles*, Society of Environmental Toxicology & Chemistry (SETAC), Pensacola, Florida.

Thiemann, G.W & Wassersug, R.J. (2000) Biased distribution of trematode metacercariae in the nephric system of *Rana* tadpoles. *J. Zool. Lond.* **252:** 534-538.

Thiemann, G.W & Wassersug, R.J. (2000) Patterns and consequences of behavioural responses to predators and parasites in *Rana* tadpoles. *Biol. J. Linn. Soc.* **71:** 513-528.

FROGLOG is the bi-monthly newsletter of the Declining Amphibian Populations Task Force. John W. Wilkinson, Editor, Department of Biological Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, U.K. Tel +44 (0) 1908 – 652274, Fax: +44 (0) 1908 – 654167, E-mail: **daptf@open.ac.uk**

Funding for FROGLOG is underwritten by the Detroit Zoological Institute, P.O. Box 39, Royal Oak, MI 48068-0039, USA