Bufo viridis by Tim Halliday

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FROGLOG

Newsletter of the IUCN /SSC Amphibian Specialist Group (ASG)

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IUCN /SSC Amphibian Specialist Group (ASG) Seed Grants 2007

The IUCN/SSC Amphibian Specialist Group (ASG) is pleased to announce a new round of Seed Grants for 2007. These are intended as one-time awards of between $500 and $2000 for the support or initiation of research that furthers the ASG's mission to conserve biological diversity by stimulating, developing, and executing practical programmes to study, save, restore, and manage amphibians and their habitats around the world

There are three categories in this year's round, thanks to generous support from Andy Sabin, the US Department of the Interior's Amphibian Research and Monitoring Initiative (ARMI), and from the North of England Zoological Society-Chester Zoo in the UK.

ARMI AWARDS. The criterion for these awards is that the proposed work should be done on species or issues of concern in the USA. ARMI is particularly interested in funding research on potential stressors of amphibian populations. For more information about ARMI, go to: *http://armi.usgs.gov/*

CHESTER ZOO AWARDS. Grants are available to support specific amphibian conservation action for new or existing initiatives. This action may be captive breeding, local community initiatives, habitat protection or population monitoring.

UNRESTRICTED AWARDS. The ASG welcomes applications that address any aspect of amphibian declines, but favours joint applications involving partnerships between herpetologists in developed and developing countries. We are also prioritising projects that: investigate synergistic effects between two or more factors that have been identified as actual or potential causes of amphibian population declines and which, implement amphibian conservation on the ground.

Applicants should indicate which of the above categories they wish their application to be considered for, but we will consider applications in the ARMI and Chester Zoo categories also in the Unrestricted category.

Proposals should be **no more than 4 pages** and contain 1) Name, affiliation and contact information of the proposer(s), (2) Project title, (3) Description of the intended work, including localities and species involved, (4) Start date and schedule of the project, (5) Explanation of how the project will further the ASG's mission, (6) Budget breakdown, including details of additional funding obtained or sought from elsewhere (please note that we do not provide funds to support salaries), (7) References, if appropriate, and (8) Any other pertinent information.

Please send proposals by the 15th of December, 2006 to Jeanne McKay at: *J.E.McKay@kent.ac.uk* or to: Jeanne McKay c/o The Durrell Institute for Conservation and Ecology (DICE), The University of Kent, Marlowe Building, Canterbury, Kent CT2 7NR , UK.

All information acquired with the support of the ASG remains the intellectual property of the grant recipient, but must be freely available to the ASG for use in furthering its mission. Successful applicants are generally expected to publish the results of their projects in refereed journals, or as articles in the ASG newsletter, *Froglog*. In addition, Seed Grant recipients will be required to provide a brief mid-term and final report of their project so their findings can be made available to Seed Grant donors and ASG members. A reporting structure will be provided with award letters.

Please contact Jeanne McKay if clarification or advice is required.

Tropical amphibian diversity and edge effect

By J. Nicolas Urbina-Cardona
Instituto de Biologia, UNAM, Mexico D.F.

Amphibian diversity is threatened by direct threats (e.g. diseases, pesticides, habitat loss and trade) and indirect threats (e.g. climate change, invasive species and synergistic effects), which reduce their population viability and increase their vulnerability to extinction (Semlitch, 2003). One of the most important factors causing tropical amphibian decline is habitat loss (Semlitch, 2003) which often results in a seminatural landscape composed principally of forest fragments immersed in an agricultural matrix (Saunders *et al.,* 1991). Edge effects play an important role in fragmented habitats, and edge-avoiding amphibians are particularly prone to local extinction (Lehtinen *et al.,* 2003).

For my doctoral dissertation at the Universidad Nacional Autonoma de Mexico (UNAM) in Mexico D.F., the relationship between amphibian diversity and their microhabitat was evaluated along a pasture–edge–interior gradient, in the tropical rainforest at Los Tuxtlas, Veracruz, Mexico. To investigate the relationships between microhabitat variables and species composition and richness, 14 ecotones were each divided into three habitats (pasture, forest edge and forest interior). Three transects per habitat were then sampled four times between June 2003 and May 2004 using equal day and night efforts. Twelve environmental variables

describing the microclimate, vegetation structure, topography and distance to forest edge and streams were evaluated.

A total of 1256 amphibians belonging to 21 species (12 in the pasture, 14 at the edge, and 13 in the interior) were recorded. The greatest percentage of amphibian individuals was recorded in the interior (47%) and on the edge (45%), while only 8% were captured in the pasture. At the forest edge and forest interior habitats, 52% of the individuals were adults, and 48% were juveniles. In the pasture 81% of the individuals were adults, and 19% were juveniles (Urbina-Cardona et al., 2006). The surrounding pasture matrix was dominated by the leprus chirping frog *Syrrhophus leprus*. The forest edge and forest interior habitat was dominated by the polymorphic robber frog *Craugastor rhodopis*. Towards the pasture, amphibian species that displayed a reproductive mode with aquatic eggs and larvae (type 1) and occupation of terrestrial habitats increased. While towards the forest interior amphibian species with direct embryo development and with fossorial and arboreal habitats increased (Urbina-Cardona & Reynoso, 2005).

Amphibian community structure was strongly affected during the wet season by the combination of canopy cover, temperature, and leaf litter cover; and during the dry season by the combination of distance to streams, temperature, and leaf litter depth and cover. A high degree of complexity was detected in the relationship between forest interior amphibian species and their microhabitat (Urbina-Cardona et al. 2006). The species *Pseudoeurycea orchimelas*, *Cranopsis valliceps*, and *Craugastor vulcani*, were identified as being truly forest interior, edge-avoiding species. These amphibians tend to undergo local extinction in Los Tuxtlas because they require forest fragments with high habitat quality (e.g., high leaf litter cover, understorey density and relative humidity, and low temperatures) in order to reproduce and survive. These species could reflect the habitat quality of the forest interior and their disappearance may be an indication of habitat degradation within a fragment, or that a fragment is not large enough to exclude edge effects (Urbina-Cardona et al., 2006). These species should be monitored more closely, since they are highly sensitive to perturbation and are often the most vulnerable to fragmentation.

Relating the use of the pasture-edge-interior gradient with amphibian microhabitat provides important information for the development of conservation strategies to preserve amphibians as a whole in seminatural environments. Future studies should therefore carefully explore the mechanisms and synergies that explain the amphibian ensembles that inhabit the interior of fragmented forest.

References:

Lehtinen, R.M., Ramanamanjato, J. & Raveloarison, J.G. (2003) Edge effects and extinction proneness in a herpetofauna from Madagascar. *Biodiversity and Conservation* 12: 1357–1370.

Saunders, D., Hobbs, R. & Margules, C. (1991) Biological consequences of ecosystem fragmentation: a review. *Conservation Biology* 5: 18–32.

Semlitsch, R. D. (2003) Amphibian Conservation. Smithsonian Institution Press, USA.

Urbina-Cardona, J.N., Olivares-Pérez, M. & Reynoso, V.H. (2006) Herpetofauna diversity and microenvironment correlates across the pasture-edge-interior gradient in tropical rainforest fragments in the region of Los Tuxtlas, Veracruz. *Biological Conservation* 132:61-75.

Urbina-Cardona, J.N & Reynoso, V.H. (2005) Recambio de anfibios y reptiles en el gradiente potrero-borde-interior en la Reserva de Los Tuxtlas, Veracruz, México. Chapter 15. In: Halffter, G., J. Soberón, P. Koleff & A. Melic (eds.) "Sobre Diversidad Biológica: El significado de las Diversidades Alfa, Beta y Gamma". CONABIO, SEA, DIVERSITAS & CONACYT. 4th volume. Monografías Tercer Milenio Press, Zaragoza, España. Pp:191-207. (In Spanish)

*For further information please contact***:** *nurbina@yahoo.com*

Reports and papers on previous DAPTF Seed Grants

Recipients of previous 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 reports, so that their results can be made available to a wider audience. Below is a list of reports that have been received recently. Anyone wanting a copy of a report should contact the author in the first instance; if you cannot reach the author, contact Tim Halliday - *t.r.halliday@open.ac.uk.*

Ansel Fong G. (2001) Monitoring amphibian populations in two sensitive habitats in Cuba.

(*ansel@bioeco.ciges.inf.cu*)

Ansel Fong G. and Jean-Marc Hero (2003) Population dynamics of the stream-dwelling frog *Eleutherodactylus cuneatus* on La Gran Piedra, eastern Cuba. (See this *FROGLOG*)
(*ansel@bioeco.ciges.inf.cu*)

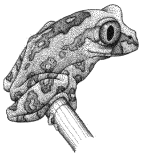
The following papers report work supported by previous DAPTF Seed Grants:

Andreone, F., Mercurio,. V. & Mattioli, F. (2006) Between environmental degradation and international pet trade: conservation strategies for the threatened amphibians of Madagascar. *Natura-Soc. it. Sci. nat Museo civ. Stor. nat. Milano:* **95;** 81-96.
(*f.andreone@libero.it*)

Bank, M.S., J. Crocker, B. Connery, & A. Amirbahman. (2007) Mercury bioaccumulation in green frog and bullfrog tadpoles from Acadia National Park, Maine, USA. *Environmental Toxicology & Chemistry*: **26;** 37-44.
(*mbank@hsph.harvard.edu*)

Widder, P. D. & Bidwell, J. R. (2006) Cholinesterase activity and behaviour in chlorpyrifos-exposed *Rana sphenocephala* tadpoles. *Envtl. Toxicol. & Chem:* **25;** 2446-2454. (*widder@vt.edu*)

Tim Halliday



Population dynamics of the stream-dwelling frog *Eleutherodactylus cuneatus* on La Gran Piedra, eastern Cuba

A Seed Grant report by Ansel Fong G. and Jean-Marc Hero

Eleutherodactylus cuneatus is one of five semi-aquatic, stream-dwelling Cuban frogs of this genus. *E. cuneatus* lives in forest areas and

individuals are typically found on the ground, in little caves in earth walls or in the ground. Juveniles are sometimes found on shrub leaves up to 30 cm above ground.

The natural history of this species is poorly known, and is limited to anecdotal information found primarily in taxonomical papers (Schwartz & Henderson, 1991; Estrada & Hedges, 1998).

In Latin America, most unexplained declines have affected species living close to streams to a far greater extent than terrestrial species (Young *et al.* 2001). The aquatic habits, highland distribution and large body size in the genus *Eleutherodactylus* are traits predicted that species susceptible to decline share (Lips *et al.* 2003). Therefore, knowledge of *E. cuneatus* population dynamics and ecology is needed as it would be at high risk of decline or disappearing if a threatening event took place in Cuba (Williams & Hero, 1998; Lips *et al*. 2003; Hero *et al*., 2005).

The principal purpose of this study was to determine temporal variation in abundance for *E. cuneatus* on La Gran Piedra of Cuba to gather base-line knowledge, which will contribute to a rapid detection of any decline this population may undergo in the future. Data on demographic parameters, call activity and habitat were also recorded for this population.

The study was undertaken on La Gran Piedra (20°00'N, 75°36'W, 1200 m altitude); a protected area located 30 km east of Santiago de Cuba city. The study site is a stream tributary of the Indio River, which is a tributary of the Baconao River. The study was conducted from June 2003 to June 2004 at approximately bimonthly intervals. The sampling transect was along a 100 m section of a 1-2 m wide stream and searches for frogs were undertaken up to 1.5 m from each bank. Flagging-tape was tied to vegetation along the banks every 5 m along transect to provide reference points for frog capture.

Searching began at 0900 h and finished when the complete transect was traversed, typically in 5-7 hours. Frogs were detected visually by wading along the stream and thoroughly searching in all possible microhabitats: ground, under rocks and logs, inside decayed palm leaf petioles, etc. Attempts were made to capture all individuals in the stream, but some frogs escaped by jumping into the water. The total number of individuals captured, after standardizing for search effort, was used as an index of relative density (Galatti, 1992).

Frogs were marked by exclusive combinations of toe clips (Hero, 1989), and in a few cases when regeneration was noted, toes were re-clipped. Horizontal distance from water, exact point of capture, and microhabitat were recorded for each individual captured.

To quantify calling activity of males, five call point-counts were established around the stream at a minimum distance from water of 100 m. At each point the number of calling-frogs within a five minute time interval was recorded by two persons. Counts were made between 2000 and 2200 h, on one night of each of the months surveyed.

Relative density of frogs encountered on the transect varied throughout the year. The number of adults decreased rapidly in August and remained low until February, and then increased until July. In contrast, the number of juveniles peaked in March-April, and remained low throughout the rest of the year. The decrease in the number of juveniles from March to September could be explained by either high mortality or rapid growth into the adult size class contributing to the high adult relative density between May and July.

The variation in the relative density correlated with adult male vocalization suggesting strong seasonality in reproductive activity. The number of calling males was highest in June - July and calling activity extended through September, but no calls were heard from October to February. Vocalizations began again in March and extended until July, suggesting reproductive activity is highest in these months. While amplectant pairs or nests could not be found in these months, females with mature eggs were only captured in March, June, July, and August (months with calling activity).

Eleutherodactylus cuneatus is unusual, as it is a stream-dwelling frog with terrestrial direct-developing oviposition away from the stream. Although the year-round presence of juvenile *E. cuneatus* could suggest continuous reproduction, the seasonal changes in abundance and calling observed and the peak of juveniles in March/April suggest breeding primarily occurs in the wet season.

A total of 604 frogs were counted with 427 frogs captured and marked, including 71 recaptures, 106 frogs escaped capture. Adults comprised a greater proportion of the individuals caught and re-caught. The time of residence on the transect was approximately four months. Immigration rates were high as suggested by the high number of new (unmarked) frogs in each survey. There was no correlation between the number of days of residence and the initial snout-urostile length of each individual, indicating that ontogenetic differences are low or non-existent. Only two individuals were found on transect for the complete year of survey.

The four month time of residence on the transect could indicate a highly mobile population or a high mortality, but it is not possible to distinguish between them. Nevertheless, a high proportion of individuals moved, reaching distances as far as 82 m, some individuals were able to move up to 4 m in only five days. Movement data, plus the fact that adults move away from the stream to breeding sites suggest that it is a very mobile species and this may contribute to the high turnover of individuals observed.

Frogs used six substrates during the study, all of them on the ground. There was no difference in substrates used by adults and juveniles. Most of the individuals used cover objects on the ground (rock, palm, trash, etc.) and only a few individuals were found in rock/earth walls. Frogs used approximately the same proportion of substrates each month. Specimens were found either over the water or in the banks or over the earth. Most individuals were less than 20 cm from the water and many of them were on the water's edge. The mean horizontal distance from water did not differ by month.

Seasonal activity, year-round reproduction with periods of high intensity, highly mobile individuals and semi-aquatic habits with reproduction in terrestrial sites are

attributes that characterize this population of *E. cuneatus*. Some of these attributes are shared with the other *Eleutherodactylus* living in this locality (Fong, 2004). Additional study is necessary to discover what factors are conditioning the life history characteristics of *E. cuneatus* and what aspects differ among other species living in sympatry.

Acknowledgments:
Financial support for this project was from a Seed Grant from the Declining Amphibian Population Task Force (DAPTF). The Centro Oriental de Ecosistemas y Biodiversidad (BIOECO) provided permits and logistic facilities. Other participants in the project (Rolando Viña, Irelis Bignotte, Beatriz Lauranzón and Josefina Blanco) are very thanking. Sergio Scherlowski hand carried the equipment to Cuba. Yaquelín Rivera, Luis Alberto Rueda, Yeison Gutierrez, Arminda Barrientos, Yordi Barrientos, José L. Fernández and Freddy Rodríguez provided very useful field assistance.

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Fong, A. 2004. Monitoring amphibian populations in two sensitive habitats in Cuba. Technical Report, DAPTF.

Galatti, U. 1992. Population biology of the frog *Leptodactylus pentadactylus* in a Central Amazonian rainforest. J. Herpetology 26: 23-31.

Hero, J.M. 1989. A simple efficient code for toe clipping anurans. Herp. Review 20:66-67.

Hero, J.-M., S. E. Williams and W. E. Magnusson. 2005 Ecological traits of declining amphibians in upland areas of eastern Australia. J Zoology Lond. 267: 221-232.

Lips, K. R., J. D. Reeve and L. R. Witters. 2003. Ecological traits predicting amphibian population declines in Central America. Cons. Biol. 17: 1078-1088.

Schwartz, A. and R. W. Henderson. 1991. Amphibians and reptiles of the West Indies. Descriptions, distributions, and natural history. University of Florida Press, Gainesville, xvi + 720 pp.

Williams, S. E. and J. M. Hero. 1998. Rainforest frogs of the Australian Wet Tropics: guild classification and the ecological similarity of declining species. Proc. Roy. Soc. Lond. B. 265:597-602.

Young, B., K. R. Lips, *et al.* 2001. Population declines and priorities for amphibian conservation in Latin America. Cons. Biol. 15:1213-1223.

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Froglog Shorts

The following publication is now available:

Wilkinson, J. W. (Ed.) (2004) *Collected DAPTF Working Group Reports: Ten Years On.* DAPTF, Milton Keynes, UK.

This 135-page document contains reports from 27 Declining Amphibian Populations Task Force (DAPTF) Regional Working Groups across four geographic regions: Afrotropical, Oriental & Australasian, Neotropical and Palearctic. To obtain a copy, please contact Tim Halliday: *t.r.halliday@open.ac.uk.*

Important new journal

Herpetological Conservation and Biology is a peer- reviewed journal publishing original research, reviews, perspectives and correspondence on the life history ecology, management and conservation of amphibians and reptiles. Its focus demonstrates the importance of natural history to conservation efforts. Articles are published electronically in PDF with full pagination upon final acceptance. A print version will be provided to a network of key public institutions, but will be of limited availability to others. Submissions of experimental, descriptive or inferential research are welcomed.

Subject matter and topics for inclusion in the journal include: life history (reproduction, physiology, etc.), sampling (design, techniques), inventory and long-term monitoring, all aspects of ecology (especially field studies) and management case studies.

For further details, please visit the journal web site at*:* *http://herpconbio.org*

Job Announcement

Executive Officer, Amphibian Specialist Group (ASG)

The Amphibian Specialist Group (ASG) is seeking a conservation leader who can take on the global amphibian decline within the broader context of the biodiversity crisis. The ASG, a unit of the IUCN Species Survival Commission, strives to conserve biological diversity by stimulating, developing, and executing practical programs to study, save, restore, and manage amphibians and their habitats around the world. The ASG is taking IUCN's Specialist Group model to the next level of effectiveness through the establishment of a Secretariat that will serve as a dynamic hub to coordinate a global web of stakeholders and to leverage the intellectual, institutional, and financial capacity towards shared, strategic amphibian conservation goals. The Executive Officer will be responsible for coordinating the activities of the ASG to ensure a unified, strategic and sustainable approach to global amphibian conservation, effecting policy change and communicating the work of the ASG to raise the profile of amphibian issues in the public arena. Please see the full job announcement at *http://www.parcplace.org/2006-03-24CI.htm* for details.

Instructions for Authors

FROGLOG publishes a range of articles on any research, discoveries or conservation news relating to the amphibian decline phenomenon. We encourage authors describing original research to first make submissions to a refereed journal and then, if appropriate, to publish a synopsis in *Froglog.* Submissions should be in English, less than 1,000 words and follow the style of past FROGLOG issues (as should references). Due to space and formatting restrictions, please do not submit images, maps, figures or tables. Short news items and press releases are also acceptable. Please submit potential contributions to Jeanne McKay: *J.E.McKay@kent.ac.uk.*

Accepted submissions will be printed in order of receipt.

***FROGLOG* is the bi-monthly newsletter of the IUCN / SSC Amphibian Specialist Group.**