

FROGLOG

Newsletter of the IUCN/SSC Amphibian Specialist Group



Rediscovery of the Endangered and Critically Endangered endemic Guatemalan salamanders

Theodore J. Papenfuss, Carlos Vásquez-Almazán, and Sean M. Rovito

In 1974 Paul Elias, an undergraduate student from the Museum of Vertebrate Zoology (MVZ), University of California at Berkeley, visited Finca Chiblac, a remote site in the Sierra de los Cuchumatanes of Guatemala. In a single day, Paul discovered two new genera of salamanders. On September 6, he found two salamanders later described as *Nyctanolis pernix* (Elias and Wake, 1983) and three salamanders later described as *Bradytriton silus* (Wake and Elias, 1983). Paul returned to Finca Chiblac again in 1975 and 1977. By the



Bradytriton silus © Sean M Rovito

time of his final visit most of the primary forest around the finca had been cleared and he found only a single *Nyctano-*

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lis and two *Bradytriton*. Only five additional specimens of *Nyctanolis* were ever obtained. One specimen in the United States National Museum is from Lagunas de Montebello in Chiapas, Mexico and four specimens at The University of Texas at Arlington are from Alta Verapaz and Baja Verapaz, Guatemala. *Bradytriton* was not seen after 1977.

...and we were rewarded with the discovery of a new population of *Bradytriton*, 32 years after the species was last seen.

We returned to Finca Chiblac in 2005 to search for these two species, but the natural forest was gone and the small finca that Paul visited in the 1970s was now a community of several hundred people. We searched unsuccessfully for three days. At the 2008 Global Amphibian Assessment Workshop held in Chiapas we recommended that *Bradytriton* be kept in the category of Critically Endangered on the IUCN Red List of Threatened Species because of the lack of any recent sightings as well as the extent of habitat destruction in the vicinity of the type locality. The Alliance for Zero

Extinction, a worldwide consortium of 68 biodiversity conservation organizations, has designated *Bradytriton silus* as a trigger species for pinpointing and conserving epicenters of imminent extinctions, in this case, the Sierra de los Cuchumatanes. In 2008, the Critical Ecosystems Partnership Fund (CEPF) included it as one of 10 focal species of Critically Endangered Guatemalan amphibians. This funding enabled the Museo de Historia Natural (MUSHNAT) at the Universidad de San Carlos de Guatemala to join with the Guatemalan NGO, Fundación para el Ecodesarrollo y la Conservación (FUNDAECO), in conducting field surveys for these 10 species. A team of biologists from the MVZ and MUSHNAT conducted a vertebrate survey of the Cuchumatanes in January 2009 and we were rewarded with the discovery of a new population of *Bradytriton*, 32 years after the species was last seen. The salamanders were found in an



Nyctanolis pernix © Sean M Rovito

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area of cloud forest near the town of Yalambojoch. This site is about 40 kilometers northwest of Chiblac at an elevation of 1,640 meters on the Caribbean slope of the Cuchumatanes. The forest, part of a private finca, is still in fair condition, despite the limited logging of hardwood trees on the site. An additional population was subsequently located by one of us (CRVA) near the type locality of Finca Chiblac.

Based in part on the successful rediscovery of *Bradytriton*, the Mohamed bin Zayed Species Conservation Fund (MBZ) provided additional support for fieldwork in the Cuchumatanes to focus on 10 Endangered and Critically Endangered amphibians. In January 2010, our amphibian expedition passed through Finca Chiblac and continued on a dozen kilometers to the little community of San Jose Maxbal, located in a clearing surrounded on three sides by

primary tropical forest. We stayed in the village for three days and walked the forest trails and streams at night. Two of the MBZ and CEPF Critically Endangered focal species were found. One was a hylid frog, *Plectrohyla ixil*, and the second was another population of *Bradytriton si-lus*.

These two finds alone would have made the trip successful, but finding *Nyctanolis pernix* on our last night in the field was a spectacular ending to our 2010 expedition. *Nyctanolis* is an amazing salamander; the scientific name of the genus combines

the Greek word of *nyctos*, meaning night with the lizard generic name *Anolis*. This is an extremely agile arboreal salamander that behaves more like an anole than any other species of Central American salamander. The salamanders seem to be most active at night on the trunks of large trees and even leap to the ground and run away when disturbed.

This forest around Maxbal looks as Finca Chiblac must have looked to Paul Elias when he first went there over 35 years ago but unfortunately, due to the construction of a new road with logging and



Maxbal Forest Habitat © Carlos Vásquez-Almazán

land clearing sure to follow, in a few years this forest will be gone and the area will look as Chiblac does now unless measures are taken to preserve this site. Fortunately, FUNDAECO and Conservation International are now aware of the importance of establishing a protected reserve at the Maxbal forest.

Acknowledgements

Funding for fieldwork was provided by the Critical Ecosystems Partnership Fund (CEPF), Conservation International, the Mohamed bin Zayed Species Conservation Fund, the Mu-

seum of Vertebrate Zoology, and the Amphibia-Tree Project (National Science Foundation Grant EF-0334939).

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CONSERVATION

Present richness of amphibians from the Argentine Humid Chacos and their representation in the National Parks and protected areas of the region

Jorge A. Céspedes, Eugenia García and Ornela Stechina

The Humid Chaco is a phytogeographic region of the Argentine northeast (Cabrera, 1976) found within the Corrientes, Chaco and Formosa provinces and covering an approximated area of 100,000 km². Earlier species lists, spanning several centuries up to colonial times and compiled by

Cei (1980, 1987), were incomplete and the true amphibian biodiversity of this region has only been revealed within the last 15 years through the continuous efforts of methodical research (Álvarez et al., 2002; Lavilla et al., 2000; Lavilla and Cei, 2001). The number of known species for the region

increased during this 15-year period from 31 (Cei, 1980, 1987) to 56 species (Álvarez et al., 2000, 2002; Lavilla et al., 2004; Lavilla and Cei, 2001).

The Humid Chaco region of the three provinces includes 3 National Parks, 2 Provincial Parks, 1 Educative Reserve and a Ramsar site,

Continued from previous page

which protect only 41 of the 56 species. *Lepidobatrachus asper*, *L. laevis* and *Leptodactylus laticeps* (Fig 1) cited to all chacoan regions, are protected in the Formosa National Reserves and the Usos Múltiples Teuquinto Reserves, in the Dry Chaco of Argentine (Céspedes et al. 2004). *Odontophrynus lavillai* is absent in the reserve areas of the Humid Chaco, but is protected within the Parque Provincial Loro Hablador of the Dry Chaco regions of the Chaco province (Kacoliris et al., 2006) (Table 1). *Hypsiboas varelae*, *Pseudis minutus*, *Melanophryniscus fulvoguttatus*, *Pleurodema tucumanum* and *P. borelli* are not listed as present in any of the protected regions of the Humid Chaco, but it is possible that some of these species have simply

...all of which protect only 41 of the 56 species.

been overlooked or mistakenly cited for the region lists as was *Eupemphix nattereri*, which was removed from the list of Argentinian species (Lavilla et al., 2004). Recent studies have uncovered possible errors in species descriptions and identifications, which could contribute to the confusion regarding distributions of

tinean species (Lavilla et al., 2004). Recent studies have uncovered possible errors in species descriptions and identifications, which could contribute to the confusion regarding distributions of



Fig 1. *Leptodactylus laticeps* © Victor Zaracho

some species. For example, described as a full species, *Pseudopaludicola mirandae* is now considered a Junior Synonym of *P. boliviana* after errors were identified in past descriptions and comparisons of topotypes from the 2 groups (Cardozo and Lobo, 2009). Many species of the 3 provinces of Humid Chaco lack in data regarding

natural history and conservational status; *Melanophryniscus cupreuscapularis* (Fig. 2) is one of the many species considered Insufficiently Known by Lavilla et al. (2004) and is absent in the reserve areas of

the Humid Chaco.

Current action priorities for the conservation of amphibian species of the Humid Chaco include:

- Update the listing of species and state of conservation.
- Continue and expand research of the region within protected and unprotected areas alike in order to verify

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Fig 2. *Melanophryniscus cupreuscapularis*
© Jorge Cespedez

the presence and absence of all species and emphasize the necessity to create new reserve areas that contain viable populations of amphibians not found in the current protected areas.

- Introduce extension activities in primary and secondary schools of the three provinces with the objective to educate students on the roll, beauty (Fig. 3) and importance of the amphibians in their ecosystems and also, to introduce youth to their responsibilities of protecting these species and their habitats.

- Convince regional governments of the ecological importance and economic bene-

fits of promoting ecotourism in protected areas.

Unfortunately, the Chacoan regions are currently undergoing large-scale deforestation due to the extension of the soybean culture to support the Argentinian economy. However, the province of Corrientes, rich in moist soils and historically known for producing cattle and rice, is now trying to diversify its economy beyond agriculture and views ecological tourism as a profitable alternative. Luckily, the diverse species lists of animals and the presence of herpetozoos are highlights of advertising and therefore, are of profitable value.

Acknowledgements

The authors wish to thank Victor Zaracho for his collaboration and the photo of *Leptodactylus laticeps* and to Beatriz Alvarez for aid and advice.

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Fig 3. *Argenteohyla siemersi pedersenii*
© Jorge Cespedez

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RESEARCH

Status of the Sooglossidae and an action plan for their conservation

Justin Gerlach

Dramatic declines in many species of amphibians have been reported in recent years. These have been attributed to general threat factors such as habitat loss and invasive species but particular concern has been raised over the impacts of diseases and climate change, to which some amphibians are particularly vulnerable.

The amphibian fauna of Seychelles comprises only 13 species but is primarily endemic (12 species). The most iconic amphibians in Seychelles are the frogs of the

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endemic family Sooglossidae. All are currently categorized as Vulnerable on the basis of restricted range. Four species have been described from Mahé and Silhouette islands. Recently, a sooglossid has been reported from Praslin Island and is anomalous with regard to its presence at a much lower altitude and different habitat type, as compared to other sooglossid populations. Also puzzling is the fact that this population has been overlooked for over 100 years by several herpetologists. It has been suggest-

ed that this may be a recent introduction from Mahé and the status of this population is shortly to be the subject of a research project.

All four described species are restricted to cool, damp habitats. The most extreme limitations are found in *S. thomasseti* and *S. sechellensis*. Temperature is a major limitation on the range of *S. thomasseti* but rainfall is a better predictor of distribution for most species. *S. thomasseti* and *S. sechellensis* are mainly restricted to areas with levels of cloud cover. For each spe-

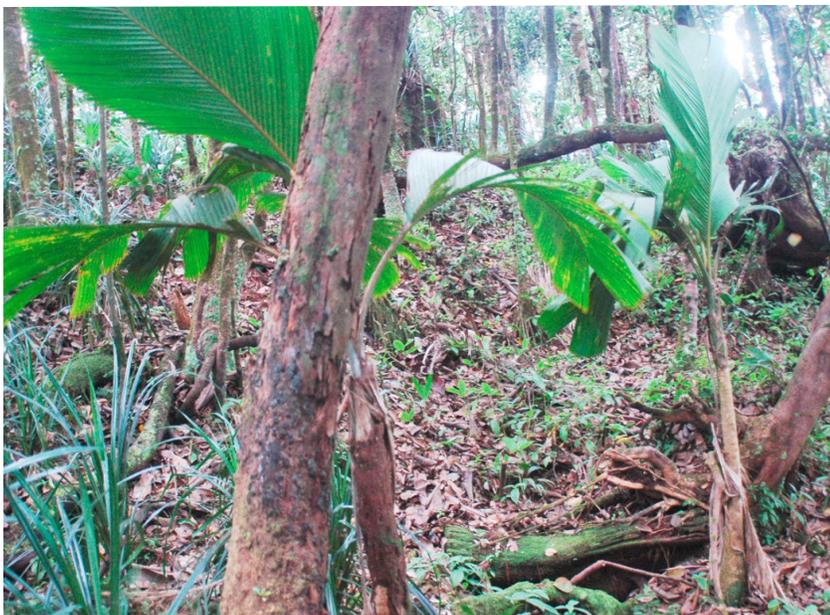
cies key sites have been identified where microclimates and microhabitats allow exceptionally high population densities. These correspond to Key Biodiversity Areas (Gerlach, 2008).

Threats to Sooglossidae Habitat Degradation

Historically, habitat degradation has been considered the main threat to Sooglossidae, with high levels of invasion by alien plants in all forest areas of Seychelles. Sooglossidae occurs at low population densities in areas invaded by cinnamon (*Cinnamomum verum*) and strawberry guava (*Psidium cattleianum*). Invasion continues in all areas and experimental habitat management has been carried out but not implemented on a large scale in high forest areas.

Climate Change

Recent studies of climate change in Seychelles have revealed a pattern of slight increases in mean annual temperatures and significant



Cloud forest on Silhouette Island © Justin Gerlach

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changes in rainfall patterns, with a progressive contraction of the duration of the rainy season over the past 10 years. The climate of the high forest areas is typically extremely damp. Monitoring of climatic factors demonstrates that rainfall is not exceptionally high in high-altitude sites, but the main source of moisture is cloud condensation. All Sooglossidae are restricted to cool, damp, forest habitats (temperature range of 18-26°C and above 85% humidity) and at least one of the species, *Sooglossus thomasseti*, is considered to be associated with mist-forest habitat and would therefore be expected to be particularly vulnerable to climate change. Observations in 2009 showed that prolonged drying is occurring even in mist-forest habitats, leading to the restriction of Sooglossidae to small patches of damp habitat. No population reduction has been recorded to date, but is expected to occur if the drying trend continues. Projected range changes following predicted patterns of climate change foretell the extinction of all wild populations of Sooglossidae within 10 years.

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Current Monitoring

Monitoring of populations, habitat and climate have been established on Silhouette Island with the support of the Mohamed bin Zayed Species Conservation Fund. Automatic data-logging rain gauges and temperature loggers have been installed at a range of altitudes. These log rainfall constantly and record temperature every two hours. A weather station compiling information

on rainfall, temperature, soil moisture and leaf wetness has been established at the edge of the cloud forest to provide data on moisture levels in the environment in addition to direct rainfall.

Frog population monitoring comprises 20 contiguous 1m² quadrats in each site. Within each quadrat, the observed number of frogs is recorded with all individuals identified to species and sexed. In addition, topography, litter depth and litter composition is recorded, providing data on the abundance, distribution and micro-habitat preferences of the frogs. This monitoring is repeated at least twice a year. Habitat is studied using 2-4 contiguous 10x25m plots in each site. At least one managed plot and one unmanaged plot is included in each site. In the former, all invasive understory plant species are completely removed while invasive canopy species are removed selectively. This will provide information on the effects of management

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on invasive species. Habitat sites are studied annually. In these sites, the diversity and composition of leaf-litter inhabiting invertebrates are also monitored to evaluate changes in frog prey availability and the diversity of invasive species (especially ants).

Status

Studies of captive frogs have identified temperature as a key limiting factor on these species (especially *S. thomasseti* and *S. sechellensis*). Projected changes in range as a result of climatic changes are shown in

tions, declines in all species are more evident as shown in Table 2. These changes may be the result of existing habitat deterioration and changing rainfall/mist patterns, but are complicated by local changes in forest structure due to landslides, tree falls and invasive plant species. The data appear to indicate that population declines and range contractions are underway in more marginal (i.e. lower altitude) habitat; a full analysis of the

includes only a small area of cloud forest and monitoring sites include the lower



Sooglossus sechellensis © Justin Gerlach

limit of this area. Changes in cloud patterns will affect this boundary at an early stage, therefore monitoring of climate change on Silhouette will provide early indications of change that can be applied to Mahé Island as well.

Habitat and population monitoring- To determine if climate change is having an impact on the ranges of the Sooglossidae, population and habitat monitoring is required. Populations of *S. sechellensis*, *S. gardnieri* and *S. pipilodryas* are monitored on Silhouette Island using established methods (Gerlach 2007). At present, suitable

Table 1. Projected changes in Sooglossidae distribution (in km²) as a result of temperature changes

	Present range	2050	2100
<i>Sooglossus thomasseti</i>	15	7	2
<i>Sooglossus sechellensis</i>	25	23	12
<i>Sooglossus gardineri</i>	50	50	30
<i>Sooglossus pipilodryas</i>	15	14	10

Table 1. Population monitoring over 10 years shows complex patterns of changes in different areas; at high elevations there are small declines in *S. sechellensis*, and slight increases in *S. gardineri*. At lower eleva-

tion data is currently underway.

Conservation Action

Plan: Research

Monitoring climate change- Climate monitoring is in place for Silhouette Island. This island

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homasseti have not been devised. In 5 sites, monitoring covers frog populations, tree diversity, tree health (leaf cover and size) and plant indicator species. Permanent habitat monitoring stations should also be employed in mist forest areas on Mahé.

Trust of Seychelles (NPTS) – monitoring on Silhouette, diet, reproduction, climate change, taxonomy; Durrell Institute of Conservation and Ecology & Seychelles Islands Foundation – taxonomic and genetic status of the Praslin population; Mu-

This, and the steep terrain of their habitat, should prevent any development affecting their ranges. The remaining threats are habitat deterioration, reduction in humidity in breeding microhabitats and introduction of chitridiomycosis. Habitat deterior-

Table 2. Three examples of annual rates of change in Sooglossid populations

Altitude	<i>gardineri</i>	<i>sechellensis</i>	<i>pipilodryas</i>	Comment
390m	-6%	-19%		mid-altitude site
450m	1%	24%	1%	mid-altitude site changed by recent tree-falls
550m	4%	<-0.1%		high altitude site

Taxonomy- The taxonomy of the family is well understood with the exception of the population reported from Praslin island. This will shortly be the subject of a taxonomic study.

Population genetics- A study of population genetics should be undertaken to determine the relationships between populations and to identify conservation management units. Currently the following organizations are involved in Sooglossidae research: Nature Protection

seum Nationale d’Historie Naturelle, Paris – mechanics of locomotion and feeding, acoustic biology.

Conservation

The wild populations of Sooglossidae are all protected by their presence in protected areas (Morne Seychellois National Park and the proposed Silhouette National Park). Areas cover the main ranges of all species, with the exception of the isolated populations on Montagne Planeau on Mahe.

ation is ongoing due to the presence of invasive plant species and is speculated to increase as a result of climate change. Climate change impacts cannot be prevented by direct conservation, mitigation is needed by restoring the ecosystems to as natural a state as possible to restore dynamic processes allowing the potential of adaptation to climate change. At present the potential impacts of chitridiomycosis invasion in Seychelles are unknown and need to be investigated. The

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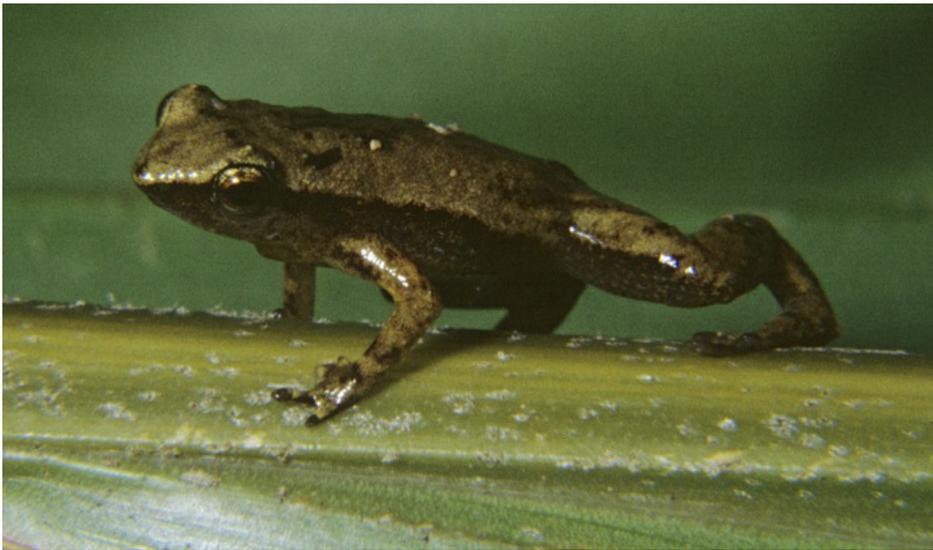
monitoring methods for *S. t-* following conservation measures are required: maintain and restore habitat; investigate the risk of chitridomycosis infection; establish assurance colonies.

ease monitoring.

Assurance colonies-

Habitat management can only mitigate against some aspects of climate change and there is a high risk that a prolonged dry spell or a significant rise in

the risks cannot be completely eliminated. With the very narrow ranges of these species, extinction is probable. Accordingly, the long-term survival of the Sooglossidae may require the establishment of assurance colonies. NPTS has maintained captive groups of *S. gardineri*, *S. pipilodryas* and *S. sechellensis* for several years, but has not succeeded in breeding them to date.



Sooglossus pipilodryas © Justin Gerlach

Maintain and restore habitat- Habitat restoration to reduce the impact of invasive species is required in the following areas: Mahé- Morne Seychellois, Morne Blanc, Congo Rouge; Silhouette-Jardin Marron, Mon Plaisir, Gratte Fesse.

Chitridomycosis risk- Requires establishment of dis-

temperature could lead to catastrophic population declines in some sooglossids, especially *S. thomasseti*. This could cause extinction directly or might lead to long-term inviability due to population decline and inbreeding. Similarly, implemented measures may minimize the risk of fungal disease establishment and spread, but

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Call for IUCN Database Intern

Description:

The IUCN - CI Biodiversity Assessment Unit, a joint initiative between the International Union for Conservation of Nature and Conservation International, seeks an intern to assist with maintenance and update of the amphibian conservation assessment database in the IUCN Red List of Threatened Species (<http://www.iucnredlist.org/initiatives/amphibians>).

Global conservation assessments allow for the establishment of global baselines for biodiversity monitoring; they are critical tools for the identification of priority species and areas and their maintenance is thus fundamental for informing conservation action. The intern will help update the amphibian database by performing one or a combination of the following tasks: revising taxonomic authorities in the Red List, revising conservation actions for threatened amphibians and revising biogeograph-

ic realm codings for a subset of the data. The intern will receive formal training in both the IUCN Red List Categories and Criteria and IUCN's Species Information System (SIS) database.

Qualifications:

- a good understanding of amphibian taxonomy, amphibian declines and amphibian conservation
- strong internet-search and data-mining skills
- strong English language skills
- experience with MS Excel
- attention to detail

Compensation:

While the internship provides no paid remuneration, the intern will receive free copies of the following books upon conclusion of the internship:

Threatened Amphibians of the World

<http://www.lynxeds.com/product/threatened-amphibians-world>

Extinction in Our Times

<http://www.oup.com/us/catalog/general/subject/LifeSciences/Ecology/ConservationBiology/?view=usa&ci=9780195316940>

Timing and location:

Three (3) months full-time or six (6) months part-time. There are no restrictions on location, insofar as the intern has access to a good working computer and high speed internet access.

How to apply:

Please download the application form from <http://www.amphibians.org/ASG/Internship.html> and send the completed form to Neil Cox at n.cox@conservation.org

Incomplete applications will not be considered.

Deadline for application:

11, June, 2010

Funding Opportunity: IUCN/ASG Offers Unrestricted Seed Grants

The IUCN/SSC Amphibian Specialist Group (ASG) is pleased to announce a new round of Unrestricted Seed Grants. These are intended as one-time awards of between \$1,000 and \$5,000 for the support or initiation of projects that furthers the ASG's mission 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 welcomes applications that address any aspect of amphibian declines, but favors applications from developing countries, or joint applications that involve a partnership between developed and developing countries.

We prioritize projects that:

Investigate synergistic effects between two or more factors that have been identified as actual or potential causes of amphibian population declines

Apply directly to a conservation question

Implement amphibian conservation on the ground

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

Please send proposals to Dr. Robin Moore at rdmoore@conservation.org

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 Robin Moore at the above email address if clarification or advice is required.

Deadline for proposals:

Tuesday 6, July, 2010.

Funding Opportunity: Wildlife Without Borders Grant

Earlier this month, U.S. Fish and Wildlife Service's Division of International Conservation announced the much anticipated "Wildlife Without Borders- Amphibians in Decline" funding opportunity.

The Wildlife Without Borders- Amphibians in Decline program will fund projects that conserve

the world's rapidly declining amphibian species. This program will support activities that address threats to frogs, toads, salamanders, newts, and caecilians that face an unprecedented threat of extinction. Funding will be made available for conservation of species with native ranges in countries with the greatest need for conservation fund-

ing.

Deadline for applications:

15, June, 2010

For further information please visit either:

Grants.gov OR

<http://www07.grants.gov/search/search.do;jsessionid=5kZBLyFJhj1mhdb1rPL4x0vtMnrhTQF82cwlR22Tkp46GZYL8jxs!1118045526?oppId=54633&mode=VIEW>

Funds for Habitat Protection

The ASG supports organizations working to protect critical amphibian habitat worldwide. This

fund is specifically for direct conservation action, not research (although some funds can be earmarked for sur-

vey work if this is an integral component of the overall project). Criteria and examples of funded projects can be found at www.amphibians.org

Support ASG

You can now make online tax-deductible donations to the ASG. Please help us protect amphibians and their habitats by visiting www.amphibians.org and clicking "Support Us".

Instructions to 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, normally no more than 1000

words and follow the style of FROGLOG Vol 91 (as should references). You may also submit images, maps and figures. We encourage the submission of photographs to accompany text. Short news items and press releases are also acceptable. Please submit potential contributions to Robin Moore at the address in the box to the right.

FROGLOG is the bi-monthly newsletter of the Amphibian Specialist Group (ASG). Articles on any subject relevant to the understanding of amphibian conservation, research and / or assessments should be sent to: Robin Moore, Editor, Conservation International, 2011 Crystal Drive, Suite 500, Arlington, VA 22202, USA.

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