

# FROGLOG

Newsletter of the Declining Amphibian Populations Task Force  
of the World Conservation Union's Species Survival Commission.

January 1997, Number 20.



## More Seed Grants Available

We are pleased to announce that the DAPTF Board has succeeded in obtaining funding for a further programme of Seed Grants, usually intended as one-time awards of between \$500 and \$2,000 for the support or initiation of research projects which further the DAPTF's Mission. Succinct proposals of less than 4 pages should be addressed to Tim Halliday at the Task Force address given at the back of this Froglog. There is no required format, but each proposal should include a description of the intended work and a statement as to how the project will fulfill Task Force objectives.

Proposals will be reviewed by external experts before approval in conjunction with DAPTF Chair, Ron Heyer, and according to funding availability. Award criteria will be based on scientific rigour and current DAPTF priorities.

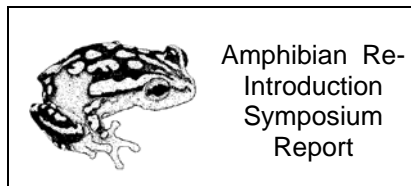
*John W. Wilkinson, International Coordinator.*



## The DAPTF in Prague

The 3rd World Congress of Herpetology takes place in Prague in August 1997 and the activities and concerns of the DAPTF will feature prominently at that meeting. The DAPTF Board will be holding its annual meeting during the Congress and it is likely that at least part of its deliberations will be held in open forum. Tim Halliday has organised a full-day symposium on the Geography and Causes of Amphibian Declines and we also hope to have a Round

Table or some other form of open discussion session. We hope that many DAPTF members will make it to Prague and will meet up with us there.



## Amphibian Re- Introduction Symposium Report

**By Brian Pomfret**

On April 15th 1996, the Royal Botanical Gardens (RBG) in Canada hosted a symposium on amphibian re-introductions in support of their 1995 amphibian habitat creation project, which is part of the long-term restoration of Cootes Paradise, a 250 ha urban marsh located on the extreme western edge of Lake Ontario. This area has lost 10 of 15 historically occurring species of amphibians since the 1920s. The symposium was organized to assist in the development of a plan for the re-introduction of extirpated species at the newly created site.

A number of significant issues and recommendations arose from the symposium. The first was that RBG wait from between 2-12 years before attempting amphibian re-introductions. This gives the site a chance to mature and to undergo a natural increase in the availability of suitable microhabitats. Re-introducing species into a stable system was viewed as having fewer risks to the area's community structure than a re-introduction into a system undergoing widespread change.

Natural recolonization was viewed as preferential to re-introduction, with a greater possibility of establishing a self-replicating population at target sites. Re-connecting severed links between populations fosters the creation of a metapopulation, which improves the chance of persistence of amphibians in an area. Unfortunately, there are

inherent difficulties associated with this approach in a heavily urbanized landscape. It may prove necessary to create more sites and develop linkages for a successful re-introduction programme.

Determining species that can successfully coexist is of great importance in the selection of appropriate candidate species for re-introduction. Some species naturally exclude others over time through competition for resources and/or predation. Adding a species to a site with another species already occupying a similar niche would prove detrimental to both species.

Related to the above is the issue of site size. A large site may have enough micro-habitats to support many species with slightly overlapping requirements, while a small site may not be capable of this. Connectivity to surrounding sites may alleviate some of the problems associated with small site size.

Samples of genetic material should be taken from the re-introduced population and stored for future comparison with the population on-site once it has become established. This allows determination of whether the population became established from the re-introduction, or from an unseen recolonization. Monitoring the site on a regular basis, both pre- and post- re-introduction was viewed as being of paramount importance.

*Symposium proceedings will be published in early 1997, and will be available for a nominal fee. Contact:*

The Science Department, Royal Botanical Gardens, PO Box 399, Hamilton, Ontario L8N 3H8, Canada.



## The Status of Amphibians in Slovenia

**By Nusa Vogrin**

## DAPTF-Slovenia

Slovenia has been described as a meeting-point of four different landscapes (Alpine, Mediterranean, Illyrian and Pannonian) in an area of 20,256 km<sup>2</sup>. In this diverse landscape live twenty species and four subspecies of amphibians. One of the most interesting is the olm (*Proteus anguinus*). *Proteus a. anguinus* is the nominative cave-dwelling form, and *P. a. parkelj* is a black form with well-developed eyes. Both subspecies are classified as rare and vulnerable on the Slovenian Red List. Increasing water pollution is the main threat and reason for the decline in populations of this cave salamander.

Three species are not listed on the Red List: *Salamandra salamandra*, *S. atra* and *Hyla italica*. *Hyla italica* was described by Nascetti *et al* in 1995. It was found in one locality near the Italian border. Fifteen species and one subspecies are in the category "indeterminate" (*Triturus meridionalis*, *T.v. vulgaris*, *T. carnifex*, *T. alpestris*, *Bombina variegata*, *B. bombina*, *Pelobates fuscus*, *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Rana ridibunda*, *R. lessonae*, *R. kl. esculenta*, *R. dalmatina*, *R. temporaria* and *R. arvalis*). *Rana latastei* is classified as rare. *Triturus alpestris lacusnigri* is considered extinct following the introduction of exotic salmonid fish into the alpine lake Crno Jezero (Black lake).

The Red List of Endangered Amphibians in Slovenia shows the extent of our knowledge of Slovenian amphibians, and not the actual situation in the field. It was published on the basis of very limited data.

During the last thirty years, drainage has destroyed 99% of the wetlands and swamps in the sub-Pannonian region. *Bombina bombina*, *Pelobates fuscus* and *Rana arvalis* have lost their main habitats in this way. The region is now one of the most agricultural areas in Slovenia. There have also been changes to the river Drava, Slovenia's biggest river. Hydro-electric dams now regulate the river's flow, many floodplain areas have been drained and about 70% of the alluvial forest along the river has been lost. The last wet meadows in this area were almost destroyed in 1993 when the land tenant changed their useage to an extensive fish farm. The fact that ten species of amphibian and some very rare plants and birds lived there was ignored. The amphibians now mainly live in secondary habitats, especially gravel pits.

Eleven species of amphibians have been found in gravel pits.

Unfortunately, the gravel pits are also under threat; the local authorities would like to fill them in. Another important problem (not only for the amphibians) is water pollution. Much higher concentrations of nitrates, nitrites and pesticides have been found than are allowed under EC law (Arcon *et al*, 1992). Amphibian spawn has decayed before hatching of the larvae in the last few years.

Due to increasing infrastructure development in other parts of the country, many habitats have been destroyed or fragmented. This is the other major cause of amphibian declines in Slovenia. A particular problem is the introduction of exotic fish species into almost every pond. Many ponds are completely useless, except for *Bufo bufo*.

Habitats in the Mediterranean and Illyrian regions are disappearing in a different way. The majority of breeding sites there are *kal*, or small ponds used for watering livestock. People have abandoned these ponds on a large scale and many have dried up.

All amphibians except *Salamandra salamandra* are protected under Slovenian law. Despite this, you can still buy frogs' legs in restaurants which have come from the nearest pond. An unknown number are also used for research, education and private collections. For the effective conservation and protection of these species, a new approach is required. The available data are currently very limited and long-term studies will be needed in order to determine those areas and species needing special protection. At this time, the priority areas are those in north-east Slovenia that contain locally very endangered *Bombina bombina* and *Pelobates fuscus*. *Triturus carnifex* and *Rana latastei*, both of which have a narrow Slovenian distribution, are also in need of special attention. Draining has already destroyed much *R. latastei* habitat near the Italian border.

Arcon, M. *et al* (1992) *Water quality in Slovenia, 1991*. Hydrometeorological Institute of Slovenia, Ljubljana.

Nascetti, G., Lanza, B. and Bullini, L. (1995) Genetic data for the specific status of the Italian treefrog (Amphibia: Anura: Hylidae). *Amphibia-Reptilia* 16: 215-227.

### Contact:

Nusa Vogrin, Vransko 121, SLO-3305 Vransko, Slovenia.



### By S.V. Krishnamurthy

The Malnad region is part of the Western Ghats in Karnataka state; an area of high endemism for many groups, including amphibians. The hilly terrain and forests are home to more than 58 amphibian forms. Of these, the most interesting are species of the genus *Nyctibatrachus*. Five species (*N. major*, *N. humayuni*, *N. aliciae*, *N. sanctipulustris* and *N. pygmaeus*) are recorded from this terrain. Scientific information on most of these species is confined to records of occurrence, but for *N. major*, some details on habitat features, larval morphology and physiology exist.

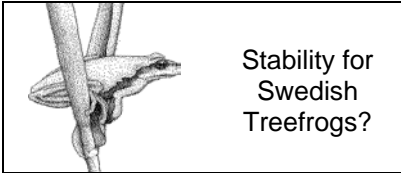
*N. major* is an uncommon endemic. It can be found beneath half-submerged rocks or in the humus-filled pools of undisturbed, core-forest streams. Adults possess a poor dispersal capacity, remaining confined to the streams for most of the year, and both adults and larvae possess narrow microhabitat requirements.

Recently, denudation of the forests for timber, fuel and collection of material to furnish organic agricultural mulch has greatly increased in this habitat. A resulting decrease in canopy cover has allowed more direct light penetration to the exposed streams and their margins. Moreover, forestry and mulch collection have increased soil erosion and consequently the silt-load of formerly pristine forest streams. This anthropogenic activity is now causing significant habitat alteration and destruction.

*Nyctibatrachus major* was already becoming rare in forest streams flowing through agricultural fields. As a result of recent activities, its distribution is decreasing every year as more habitat becomes affected. The precise reasons for such a decrease and the species' dependency on specific habitat types have yet to be properly analysed.

*Dr. Krishnamurthy is hoping to conduct further work on N. major, especially in relation to larval microhabitat preferences. Contact:*

Dr. S.V. Krishnamurthy, Dept. of Studies in Env. Science, Kuvempu University, Jnana Sahyadri, Shankaraghatta - 577 451, Shimoga District, Karnataka State, India.  
Fax: (India) 08182 - 37255



Stability for Swedish Treefrogs?

By John Baker

Unlike regions of the world where amphibian declines have lacked readily identifiable explanations, those in Northwest Europe have been primarily attributable to local anthropogenic habitat modification. Within this region, the fate of amphibians has been strongly linked to agricultural practices and recent intensification of agriculture has been the most likely cause of declines in many species. However, work on the European treefrog (*Hyla arborea*) in southern Sweden suggests that their rate of decline in this area appears to have abated.

The European treefrog is a widespread species that is believed to be in decline over much of the north-west area of its distribution. Populations in Sweden have been no exception, with reductions in the species' range and a decrease in numbers being noted throughout this century up until the mid 1970s. However, more recently (1982 and 1989-1992) Per Edenhamn and his co-workers surveyed about 1,500 ponds within the remaining Swedish distribution (1,200 km<sup>2</sup>) recording treefrog numbers and habitat variables. The presence of fish had a strong negative effect on tree frog breeding success and pond isolation was associated with an increased likelihood of extinction. Over the survey period of 1989-1992 the frogs exhibited metapopulation dynamics. 14-15% of the populations became extinct but overall the numbers of calling males and occupied ponds increased, with 33-47% of the occupied ponds being newly colonized. Moreover, the numbers of ponds occupied (181-257) were comparable to those of the 1982 survey (227).

One conclusion from this work is that the habitat needs of this species can be met through suitable management of ponds in agricultural areas; following fairly simple prescriptive measures of maintaining groups of fish-free ponds on lightly grazed pasture land. One may assume that it was the disappearance of breeding habitats of this kind, or similar, that led to the earlier declines in tree frog populations.

Edenhamn, P. (1996) Spatial dynamics of the European treefrog

(*Hyla arborea* L.) in a heterogeneous landscape. *Doctoral dissertation, Swedish University of Agricultural Sciences, Uppsala, Sweden.*

Contact:

John M.R. Baker, 4016 NW Witham Hill Drive #67, Corvallis, OR 97330, USA.



Toads in the United Arab Emirates

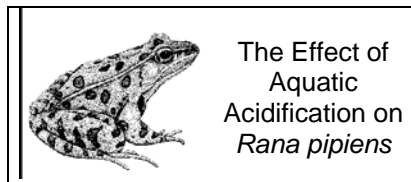
From Dr. M. A. Reza Khan DAPTF-UAE

Just two amphibian species are known to occur in the whole of the United Arab Emirates. They are the Arabian toad (*Bufo arabicus*) and the Dhufar toad (*B. dhufarensis*). *B. arabicus* is by far the commoner species, but both can be found in the rugged mountainous region in the east which borders the Sultanate of Oman. The toads do not occur west of 55° east.

Sporadic showers fall over the majority of the U.A.E., usually erratically and during the cooler months of the year. However, there is no certainty of annual rainfall at all. The toad breeding season usually coincides with the rains, but in the absence of rain, breeding takes place in restricted localities with either *falaj* (running water) or permanent *wadi* pools. In some regions, tadpoles can be seen all year round, with a peak in the rainy winter months prior to May. The main cause of tadpole mortality is the drying-up of breeding sites. There was unusual rainfall from mid-October 1995 to March 1996 that resulted in an over-production of toads in hilly areas. Toads could be found breeding throughout this period. During August and September 1996, however, no tadpoles have been seen.

Extract from report submitted to the DAPTF office. Contact:

Dr. Reza Khan, Head of Zoo section, Dubai Municipality, PO Box 67, Dubai, United Arab Emirates.



The Effect of Aquatic Acidification on *Rana pipiens*

By Marc Brodtkin and Martin Simon

Habitat degradation has been proposed as one of several causes for the decline in amphibian populations. Acidification of ponds and lakes due to environmental causes may be one factor or stressor contributing to habitat degradation and population

decline. To test the effect of acidic stress on *Rana pipiens* the following experiments were performed.

*Rana pipiens*, caught in the wild, were exposed in the laboratory to sterile water adjusted to a pH of 5.5 or 7.0. Frogs were held at either pH for a period of up to ten days. The purpose of these experiments was to measure the effect of an environmental stressor, such as an acidic pH, on *R. pipiens* splenic white blood cell function and overall frog mortality. At several points after exposure to either pH 5.5 or 7.0 frogs were inoculated with one micrometer fluorescent microspheres. Eighteen to twenty-four hours later the spleen was removed, a single cell suspension prepared and examined by fluorescence microscopy. Splenic cells were categorized based on the number of microspheres ingested per cell. These categories were 1,2,3,4-9, and greater than 10 microsphere(s) per cell.

Frogs stressed at the acidic pH had, overall, fewer splenic cells with microspheres and fewer microspheres per cell. An analysis of each phagocytic category revealed that acid-stressed frogs were less efficient at ingesting ten or more microspheres per cell when compared to the control group held at pH 7.0. That is, the frogs were less efficient in the highest phagocytic category. This coincided with our previous observations that *R. pipiens* exposed to pH 5.5 exhibited both significantly higher bacterial colonization of the spleen and overall mortality than the control group exposed to pH 7.0. We therefore believe that stress, in the form of an acidic pH, reduces white blood cell phagocytic efficiency. This may allow bacteria to colonize the spleen, leading to systemic distribution of bacteria and death.

Contact:

Marc A. Brodtkin, Department of Biology, Widener University, One, University Place, Chester, PA 19013, USA.

[brodtkin@pop1.science.widener.edu](mailto:brodtkin@pop1.science.widener.edu)

Martin P. Simon, Biology Department, Benedictine College, Atchison, Kansas 66002, USA.

[msimon@raven.benedictine.edu](mailto:msimon@raven.benedictine.edu)



USA National Coordinator's Report

By Michael J. Lannoo

Over the past two years the US Working Group has undertaken several initiatives in an attempt to determine the conservation status of its amphibians. The highest profile effort has been a liaison with the National Biological Service and the Canadian Working Group to offer a North American Amphibian Monitoring Program (NAAMP). This has been coordinated by Sam Droege. It is designed to be statistically rigorous and to employ a volunteer work force. Over half of the US states have adopted some form of program. This presents an opportunity to involve the public in a project that has the potential to offer a standardized, large-scale database to be used in assessing the conservation status of amphibians.

We are about to begin a book project, to be entitled: "The Status and Conservation of United States Amphibians." The book will be due out in the year 2000. Details will be announced soon.

Several individuals and working groups have been addressing issues of amphibian declines. Particularly newsworthy activities have included the work of Andy Blaustein's laboratory on the effects of UV-B radiation on amphibian survivorship, the work of Gary Fellers' laboratory on the causes of the declines of California amphibians, and the recent symposium held by Joe Tietge and sponsored by the US Environmental Protection Agency on limb and eye deformities in frogs. During this symposium, the work of Judy Helgen, Bob McKinnell, Dave Hoppe, Stan Sessions, Martin Ouellet and Val Beasley was highlighted. At the 1996 SSAR meeting in Lawrence, the US Working Group sponsored a workshop entitled: "Population Status and Conservation of Amphibians."

Several new state and regional field guides have been published, or soon will be. The US Central Division will be publishing (next July, with the University of Iowa Press) a book entitled: "The Status and Conservation of Midwestern Amphibians". Additionally, I have written a summary of my research results from a historical, landscape, and ecosystem perspective in "Okoboji Wetlands: A Lesson in Natural History", also published by the University of Iowa Press.

Many US Regional Working Groups have now met and are working on regional issues; many groups now have world wide web sites. The awareness of the potential impacts of amphibian declines has caused this issue to become a priority

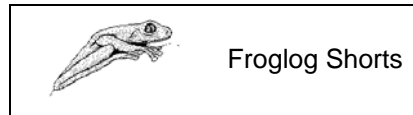
for funding among several federal and state agencies.

Our future plans include the book project mentioned above. I continue to encourage Regional Working Groups to meet and discuss local problems, and to pursue integrative projects to address both local and regional concerns. I have also been encouraging the collection of basic natural history data. Answering questions such as how long do particular species of amphibians live and how far can they disperse are critical to conservation efforts. My own research has been focusing on the interactions between amphibians and wetlands across drought cycles in the Prairie Pothole Region of the Upper Midwest and Great Plains.

**Contact:**

Michael J. Lannoo, Muncie Center for Medical Education, Indiana School of Medicine, Ball State University, Muncie, IN 47306-0230, USA.

**00MJLANNOO@bsuvc.bsu.edu**



**DAPTF Members Special Offer:** Eurospan are extending a special offer to DAPTF members on behalf of Krieger Publishers. They have a wide and varied list of herpetology titles, a selection of which they are offering to us at a 15% discount. Titles include "A Guide to Frogs and Toads of Belize" by John Meyer (our Working Group Chair for Belize) and Carol F. Foster; as well as related titles like "Amphibians and Reptiles of the West Indies". We gratefully acknowledge the donation of these titles to the DAPTF Library. Many other titles of interest are available.

*For further information, and a list of titles covered by the offer, contact:* Tina Moore, Eurospan Scientific, Technical and Medical Group, 3 Henrietta Street, Covent Garden, London WC2E 8LU, UK. Fax: +44 (0) 171- 379-0609

**There** is a new DAPTF Working Group for Ivory Coast, West Africa. **Contact:** Dr. Ulmar Grafe, Zoologisches Institute III, Biozentrum, Am Hubland, D-97074 Würzburg, Germany.

**Grafe@biozentrum.uni-wuerzburg.de**

**DONATIONS:** The Geraldine R. Dodge Foundation has awarded the DAPTF \$20,000 to support office operations. We are extremely grateful to the Dodge Foundation, as well as our numerous other contributors. The following contributors donated between 1 May and 30 November 1996. **Society & Zoo Donations:** Austrian Herpetological Society, Greater Cincinnati Herpetological Society, Detroit Zoo Conservation Fund, Long Island Herpetological Society, North Carolina Herpetological Society, Northern Ohio Association of Herpetologists, Tampa Bay Herpetological Society. **Individual Donations:** J. Kevin Aitkin, J.W. Arntzen, Gale Belinky, John P. Bratnober, Sandra E. D'Alessandro, Britta Grillitsch (and students), James Hanken, Rene Honegger, Mrs. Moira Hope, Jacqueline Lakocy, Michael Lannoo, Harold Laughlin, Beth Leuck, Greg Linder, D. Ashley Lonsdale, Thomas Lovejoy, Luis Malaret, Jane Mandelbaum, Matthew Mickiewicz, Nancy Norstad, Don Perschau, Alice H. Phillips, James Platz, Harvey Pough, Bonnie Raphael, Joanne Rella, Richard Samuelson, Andrew Sheldon, Betsy Spettigue, Robert Steinbach, Raine Swanick, Howard C. Taylor, Jan van Gelder, Shauna Weyrauch, Aria White, Donald C. Williams and Elizabeth Williams.



**Amphibian and Reptile Conservation** is a new journal devoted to the preservation of amphibian and reptile diversity. Vol. 1 #1 contains articles on amphibian declines and the effects of timber harvesting on *Plethodon hubrichti*. *For information and subscription details contact:* Craig Hassapakis, 2255 North University Parkway No. 15, Provo, Utah 84604-7506, USA. **ARC@byu.edu**

Badger, D. and Netherton, J. (1995) *Frogs*. Swan Hill Press, Shrewsbury. ISBN 1-85310-740-9. £19.95 hardback. (Contains general information about frogs and toads, with good-quality colour photographs and a chapter on amphibian declines.)

Corkran, C.C. and Thoms, C.R. (1996) *Amphibians of Oregon, Washington and British Columbia, a field identification guide*. Lone Pine, Alberta, Canada. ISBN: 1-55105-073-0. US\$16.95, CDN\$21.95.

Dutta, S.K. and Manamendra-Arachchi, K (1996) *The Amphibian*

*Fauna of Sri Lanka*. The Wildlife Heritage Trust, 95 Cotta Road, Colombo 8, Sri Lanka. ISBN: 955-9114-10-7.

Krishnamurthy, S.V. and Shakuntala, K. (1993) Amphibian fauna of Sringeri Taluk (Chickamagalure District: Karnataka). *J. Indian Inst. Sci.* **73**: 443-452.

Langone, J.A. (1994) Ranos y Sapos del Uruguay (Reconocimiento y aspectos biológicos). *Museo Damaso Antonio Larrañaga, Serie de Divulgación*: **5**.

Mara, W. (1996) *The Fragile Frog*. Albert Whitman & Co., Morton Grove, IL 60053, USA. ISBN: 0-8075-2580-4. \$16.95. (A new children's book for ages 8-12. Uses the Pine Barrens treefrog as a model to describe the frogs' struggle for survival.)

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Edited by John W. Wilkinson, Department of Biology, The Open University, Walton Hall, Milton Keynes, MK7 6AA, United Kingdom.

Phone: 01908 (44 1908 if ex-UK) 652274.

Fax: 01908 (44 1908 if ex-UK) 654167

E-mail: **DAPTF@open.ac.uk**

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