*Ambystoma mexicanum* by Tim Halliday

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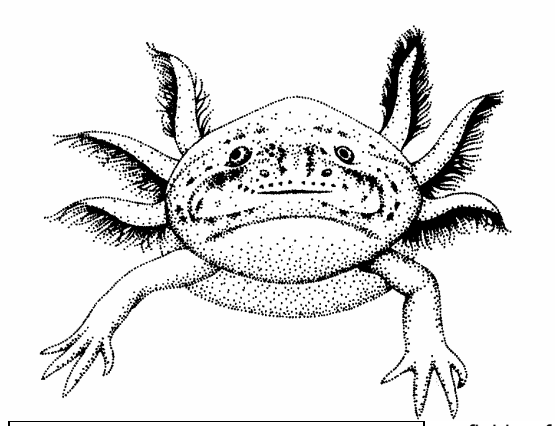


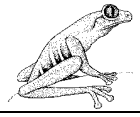
# FROGLOG

**Newsletter of the Declining Amphibian Populations Task Force**

February 2005, Number 67

***LAST PRINTED ISSUE* (see page 4)**

## DAPTF GRANTS 2005



**SEED GRANTS** We have received 48 applications this year, from 24 countries. Seven applications are for Chester Zoo grants, 13 for ARMI grants and 28 for Unconditional grants. Awards in the Unconditional category are likely to be very few in number, as we are currently very short of funds. For the first time, we have received proposals from Laos, Seychelles and Trinidad. Successful applicants will be notified in February.

**DAPTF/CEPF** We have begun discussions with potential applicants for CEPF-funded grants, announced in Froglogs 65 and 66. It has become clear that it is very important that anyone interested in these grants contact us at an early stage, outlining their ideas. There are a number of constraints on these grants, particularly in relation to the geographical location of projects, and we do not want people to waste time developing proposals that we cannot support. Contacts: Tim Halliday **(t.r.halliday@open.ac.uk)** and Don Church **(d.church@conservation.org)**

## Action for the axolotl at Lake Xochimilco, Mexico

**By Richard A. Griffiths and Ian G. Bride**

The Mexican axolotl (*Ambystoma mexicanum*) is one of Latin America's most threatened amphibians. The vast wetland upon which Mexico City was founded – and which once provided a rich and productive habitat for the axolotl and other endemic fauna – is now reduced to a handful of small, isolated patches surrounded by development. Of these, Lake Xochimilco is the largest, covering just over 2 square kilometres - but it is certainly no longer a lake. The development of the 'chinampas' – raised fields of mud and vegetation reclaimed from the lake – has been going on for centuries and has reduced the system to a series of canals running between islands of development. Today, the landscape is often referred to as the 'floating gardens' (a misnomer, as the chinampas are not floating at all). Habitat loss, introduced predators, pollution, and illegal collection for food and medicines have all taken their toll on the axolotl. Consequently, the threats facing this species are complex and not easily reversible. However, its prominent position within Aztec mythology and the ancient lacustrine economy of the region means that the axolotl is well known – although poorly understood – among local people. Some 2000 remeros (local boatmen) earn a living by punting visitors along the lake's canal system in gaily decorated pleasure trajineras (pleasure boats), and the chinamperos (local farmers) cultivate the adjacent land in a way that their ancestors have done for centuries. Fishing is also fundamental to the local economy, and although non-native carp and *Tilapia* may have replaced the axolotl as the main catch, researchers have yet to improve upon the highly skilled traditional netting method used by the fishermen for finding axolotls.

Building on its existing profile among the Xochimilcans, a partnership of British and Mexican organisations has been developing a conservation programme for the axolotl over the past three years (Griffiths et al., 2004). The project was the brainchild of the late Dr Virginia Graue of the Universita Autonoma Metropolitana at Xochimilco (UAM-X), who contacted the Durrell Institute of Conservation and Ecology (DICE) in 1999 for assistance with development of the project. As it was clear that addressing the many threats that the axolotl faced would be impossible without the co-operation of local stakeholders, the project focused on embracing local people within the conservation planning process by developing the axolotl as a flagship species for nature tourism and conservation education within the region. Using UAM-X's existing field station on the shores of the lake as a base, and with funding from DAPTF and the British Government's Darwin Initiative programme, the project partnership has run training workshops on amphibian biology and conservation for local students and conservation organisations, nature guiding for local boatmen, and souvenir production for unemployed artisans. In addition, the project has been engaged with ongoing biological research on population status and the assessment and impact of threats. DAPTF International Co-ordinator, Jeanne McKay, has been involved with the project through her Master's research (McKay, 2003) and workshop facilitation, and will continue to act as a consultant as the conservation programme develops.

Despite its precarious status in the wild, the axolotl is one of the most familiar amphibians in laboratories and aquaria throughout the world. Animals were originally collected in 1863 for the Natural History Museum in Paris, and many of today's captive animals probably stem from these founders (Smith, 1989). As a result of its well-known reproductive biology and the availability of captive populations there is considerable interest in reintroducing axolotls to Lake Xochimilco. However, there are several problems associated with such releases at this stage. At the very least, threats need to be neutralized and potential disease and genetic problems addressed before captive animals are put back into the wild (Griffiths et al., 2004). Despite the wide availability of captive bred axolotls, wild animals are still captured and sold illegally in local markets (McKay, 2003). A proposal to upgrade *Ambystoma mexicanum* from CITES Appendix II (controlled international trade) to Appendix I (species threatened with extinction and international trade permitted only in exceptional circumstances) is currently under discussion by the Mexican authorities.

As the project enters its final phase, a round-up seminar and workshop on the 'Conservation of Axolotl and the Xochimilco System' was held at UAM-X from 6-9 December 2004. The

fifty participants consisted of representatives from government and non-government organisations, universities, research institutions, the media, remeros and other local stakeholders. Over the first two days of the meeting, partners had the opportunity to present findings that had emerged from the project and other related work. The presentations covered legal protection, local planning, nature tourism, engaging the local community, ecology and impact of threats, captive breeding and reintroduction, ecoregional design, flagship species and public education. The presentations served to summarize and consolidate information gathered during the course of the project, and provide a framework for two further days of participatory workshop. Bilingually facilitated by Gerardo Garcia of the Durrell Wildlife Conservation Trust, the workshop groups were set goal-oriented tasks with a view to producing the framework for a Species and Habitat Action Plan. After brainstorming the issues facing the axolotl, the workshop groups set about placing the issues into categories, setting goals and objectives for addressing the issues, identifying appropriate actions and finally assigning timeframes and organisations to the various actions. The workshop format provided an opportunity for input from all stakeholders – ranging from local boatmen to representatives from government agencies and NGO's.

The goals for the conservation of the axolotl and its habitat were finally distilled into eight categories: (1) biology of the species; (2) legislation; (3) social actions; (4) political actions; (5) ecological interactions; (6) local environment; (7) education; and (8) resource use and harvesting. These will provide the framework for the action plan, which will be written up and published by the end of the project in March 2005 following further consultation. One of the most important outputs from the Darwin Initiative project is the partnership of diverse organisations who all have an interest in the future of the axolotl and its habitat - Grupo por la Investigacione del Ajolote y Xochimilco (or GIAX). Although the Species and Habitat Action Plan will provide a blue-print for the future, the most difficult stage – implementing the plan – lies ahead. GIAX will be instrumental in making this happen.

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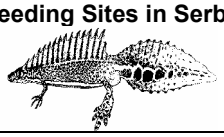
## The Status of Great Crested Newt Breeding Sites in Serbia



**By Jelka Crnobrnja-Isailovic, Ivan Aleksic & Jan Willem Arntzen,**
***DAPTF Seed Grant Recipients***

The crested newt (*Triturus cristatus* superspecies) is a group of four closely related species that inhabit a broad part of Europe and the adjacent area. In the Balkans, all four species exist and show largely parapatric distributions. The distribution of the four crested newt species in Serbia is complex (for details see Arntzen and Wallis 1999; Arntzen 2003) Local introgression of *karelinii* mt DNA haplotypes was detected in *T. dobrogicus*, *T.cristatus* and *T. carnifex macedonicus* populations, as well as introgression of *dobrogicus* haplotype in local *T. karelinii* populations. Discordance between morphology and genetics was frequent in analysed populations from Serbia.

Crested newts are among the largest members of the genus *Triturus* and are a great conservation concern because they require larger and deeper ponds for breeding than other *Triturus* species. Documented decline, which is substantial, identifies agricultural intensification (e.g. Langton *et al*, 2001) and modernization of farming methods, including the destruction of water bodies as the most notorious threats. These factors highlight the importance of maintaining the genetic distinctiveness of evolutionary significant units.

In Serbia, the status of amphibian breeding sites is poorly documented. In particular, their importance as centres for the maintenance of local amphibian community diversity is neither understood nor appreciated by the public. Consequently, amphibian breeding sites are frequently used as dumping places for all kinds of domestic and industrial waste.

The main goal of this study was to investigate the status of 53 crested newt breeding sites across Serbia. Some of the populations had previously been the subject of various genetic and/or morphological studies (references below). All sites were visited from May to July 2003, coinciding with the main period of reproductive activity and embryonic and early larval development.

Out of 53 previously documented populations 21 (40 %) were not recorded. According to local inhabitants, most change had taken place over the last decade. Reasons mentioned by local inhabitants included a prolonged spring drought resulting in changes in the underground water level and drainage. At another eight sites, the water bodies remained but no crested newts were recorded despite intensive searches. Considering our good sampling effort and the fact that the aquatic phase of the crested newt is prolonged, either as reproductively active adults, embryos or larvae, we concluded that all populations had become extinct. Since five out of these eight ponds were stocked with fish, we attribute the loss mostly to fish predation. For two of these sites, interviews with local inhabitants suggest that fish were introduced after the breeding sites were initially described. Out of the 24 remaining crested newt populations, 18 (77%) were found in habitats of anthropogenic origin which were more than 50 years old (41%) or between 20 and 50 years old (36%). Most of these man-made breeding sites were quarries, irrigation channels and clay and gravel pits situated near abandoned brick factories.

The pH of breeding sites ranged between 6.2 and 10.1 with an average of 7.8 consistent with the recorded preference of crested newts for neutral and slightly alkaline water (Langton *et al*, 2001). The maximum depth of the breeding sites was less that 0.5 meters in 4 sites, 0.5 - 2 m in 15 sites, greater than 2 m in 4 sites and undetermined in 3 sites.

Up to 38% of active crested newt breeding sites had more than half of their shoreline covered by trees, in comparison to 0% of breeding sites where crested newts were not detected in 2003. Shadow from the trees covers the southern side of the water body in 46% of active crested newt breeding sites, but in only 29% of ponds without crested newts in 2003. Significant differences, however, between ponds with and those without crested newts existed only in the percent of shoreline covered by trees ($p=<0.05$ for G-test with Williams correction =11.528, df=4). Twenty-five percent of water bodies with crested newts had no vegetation cover, while 21% of them had from 1% to 50% of the surface covered by floating vegetation. About 46% of water bodies inhabited by crested newts contained submerged vegetation covering more than 50% of the pond. No significant differences were found between ponds currently with and without crested newts for these two parameters. About 13% of active breeding sites dry up every year, 46% of them only in situations of prolonged drought and 42% are

permanent. On the other hand, only 13% of breeding sites without crested newts do not dry out. Again, significant differences were not found between these two types of ponds. The presence of fish seems to be an important factor that determines the long-term survival of local crested newt populations; while only 17% of them were found to live syntopically in aquatic habitat with fishes, in 63% of water bodies without crested newts fishes were present. These differences appear to be significant ($p=<0.05$ $G = 4.51$, $df=1$). Great crested newts suffer heaviest predation by fish during the egg and larval stages of their life cycle (Langton *et al*, 2001).

It appears that global climate changes have an apparent impact on the status of local crested newt breeding sites in Serbia. Mild winters without snow and long spring droughts in combination with high air temperatures (above 25°C) do not support regeneration of amphibian breeding sites whose function depends on the magnitude and duration of rainfall in the spring and early summer. In addition, intensive anthropogenic induced changes (soil deposition, drainage and introduction of fish species) have destroyed the suitability of many long-lasting crested newt breeding sites.

*Acknowledgements:* This work was supported by a Seed Grant from the DAPTF in 2003 and by grant B1725 from the Ministry for Science, Technology and Development of the Republic of Serbia. We thank postgraduate student Natasa Tomasevic for assistance in the field.

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## Meeting on disease and threats to amphibian biodiversity.

From November 11th to 13th about 60 investigators studying the role of pathogens in amphibian declines met at Arizona State University in Tempe to share their latest results. Participants came from South Africa, Australia, Canada, and throughout the U.S. Progress is being made in many facets of understanding how ranaviruses and the fungus *Batrachochytrium dendrobatidis*,(Bd), the cause of chytridiomycosis, infect and kill frogs and salamanders. Meeting participants heard some of the strongest evidence yet for Bd's role as a cause of infectious disease spreading through tropical forests and resulting in what the recent GAA report called the "enigmatic" decline of amphibians. *For further information contact:* James Collins **(jcollins@asu.edu)**

## Introduced fish, rotan *Percottus glenii* -an unavoidable threat for European amphibians

**By Andrey Reshetnikov**

It is well known that the introduction of fish into amphibian breeding sites can have negative consequences for amphibians caused by fish predation on eggs and tadpoles. To minimize this threat, many amphibian species reproduce in small hydrologically isolated ponds.

The fish, rotan *Perccottus glenii* Dybowski (Odontobutidae), a native of regions of Far East of Russia, northeast China, and northern North Korea, has become distributed in European Russia since 1916. This species differs from most other fish because it is able to tolerate considerable fluctuations in abiotic factors (water level, temperature) and can tolerate poorly oxygenated water, enabling it to persist in small, stagnant water bodies – favourable breeding sites of native amphibians.

To investigate rotan-amphibian interactions, research is being conducted in the region of Lake Glubokoe (55°45'N, 36°30'E; located 50 km west of Moscow) at the oldest Russian freshwater biological station founded in 1891. The lake and surrounding area form the Lake Glubokoe Reserve. Since 1994, annual ecosystem monitoring of aquatic habitats has been carried out. The number of water bodies monitored has increased from 24 in 1994 to 37 in 2004. Faunal and general limnological data were obtained and field observations (including space distribution of rotan populations and breeding success of amphibian species in a system of ponds) were completed with laboratory aquarium experiments (on comparative palatability for rotan of amphibian larvae of different species).

The rotan diet includes a wide range of animal species of all trophic levels. Rotan consumes larvae of newts *Triturus cristatus* and *T. vulgaris* and adults of the latter and this predation may also interrupt the courtship behaviour of these newts. Both species of newts were extirpated from permanent ponds and persist in only a few unstable water bodies. Over the next few years *T. cristatus* may disappear from the Lake Glubokoe region. Urodeles seem to be most vulnerable. Frog species *Rana arvalis, R. lessonae* and *R. temporaria* do not avoid spawning in ponds inhabited by rotan, although the fish entirely eliminate their larvae. However, frog species are more persistent due to the relatively high migratory capabilities of the adults, which allow them to actively use temporary water bodies and to avoid isolation of separate populations. Thus rotan stops newt and frog juveniles recruiting in permanent water bodies and transforms the metapopulation space structure of these species. The presence of this fish in small water bodies leads to a considerable decrease in species diversity of amphibian larvae. In contrast to the other amphibian species, toads *Bufo bufo* successfully breed in those waterbodies due to the comparative unpalatability of their larvae.

Colonization of this species continues. Information about non-native range of rotan was gathered through an analysis of literature sources and through a questionnaire survey of specialists (78 persons), including the personnel of reserves and national parks, in regions of Russia and other countries. As a whole, 502 localities of rotan were taken into account. This information has been entered into a database registered at the Science and Technical Center "Informregister" (Reshetnikov 2003; database №0220309453®). At present, non-native ranges of rotan include

Kazakhstan, Belarus, Ukraine, Latvia, Lithuania, Poland, Hungary, Slovakia, Serbia, and 41 regions of the Russian Federation. In Europe, rotan distribution reaches the basins of the Vistula and Tisza rivers (territories of Poland, Hungary, Slovakia, and Serbia) and European ichthyologists have recorded rotan in Poland (since 1993), in Hungary (1997), in Slovakia (1998) and in Serbia (2001). Soon, rotan may reach the Danube River and Western regions of Poland (rivers Varta and Oder). Oder and other European rivers are all interconnected by a network of channels. Therefore, there are no geographical barriers for preventing the further colonization by this dangerous invasive species. During the coming decades, a significant number of local amphibian populations will disappear in Europe as a consequence of rotan expansion.

*Acknowledgement*:s

I am sincerely grateful to everyone who provided unpublished data about new discoveries of rotan. This work was supported by RFFI (grant № 03-04-48152), Section of Biological Sciences of the Russian Academy of Sciences (grant № 2.3.8.), Ministry of industry, science and technologies of RF.

*Contact:* Dr. Andrey N. Reshetnikov, **anreshetnikov@yandex.ru**

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## Froglog Shorts

**IMPORTANT NOTICE TO OUR READERS:**

Due to escalating printing and shipping costs, we will be unable to continue providing free paper copies of Froglog to our subscribers worldwide. Therefore, this is our last printed issue. However, with your continued support we look forward to the possibility of increasing the size and frequency of our newsletter electronically which will remain available free on our website at:
**http://www.open.ac.uk/daptf/froglog/**
Froglog can also be accessed through Herp Digest's listserve at **: http://www.herpdigest.org/** We will continue printing a limited number of hard copies for our board members, sponsors and submitting authors.

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

Jinzhong Fu & Yuchi Zheng (2001) No infectious disease in western Chinese stream salamanders of the genus *Batrachuperus*. **(jfu@uoguelph.ca)**

Oommen V. Oommen (2003) Populations of southern Western Ghats' caecilians (Gymnophiona) – hypothesis testing and continued monitoring **(oommen@bigfoot.com)**

J. Kirwin Werner et al. (2002) The last leopard frogs in western Montana? **(jkw@ronan.net)** *Tim Halliday*

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**Ponds, Puddles and Pools - Trieste 2005**

The first international and friendly meeting on conservation and management of small wetlands to be held in Trieste, 20-22 May 2005.

This is an informal meeting among people who are involved, with different titles and levels, in the management and conservation of biodiversity of small freshwater ecosystems.

The meeting is an occasion to meet, to learn, to teach and to exchange any kind of experience among ponds managers, workers, scientists, students, administrators and volunteers. Posters, oral presentations, lectures, and multimedia video are most welcome but not strictly necessary. PPP05 is organized by the Pond and Wetland Wardens of Friuli Venezia Giulia in collaboration with the Trieste Natural History Museum.

The program of the meeting is a "work in progress" according to people subscription, presentation and suggestion. Final object of the meeting is to enrich shared knowledge about small freshwater habitats conservation and management.

For further information, suggestions and notes, please contact us by e-mail at the following address: **info@tutoristagni.it**

**http://www.zoneumide.org/PPO5/index en.html**



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