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IUCN/SSC Declining Amphibian Populations Task Force

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Rana latastei in Croatia and Slovenia

Rana latastei is at the eastern edge of its range in Croatia and Slovenia, known only from single sites in the two countries. However, this spring DPPVN (a newly formed society for the study and protection of Slovenian flora and fauna) which is researching amphibian distribution, discovered a new site locality. The site, three km from the historical site (near Nova Gorica), is an area of deciduous forest on a flood plain. The high water table and periodic flooding provide the typical habitat for this species.

However the site is threatened by agricultural improvements and drainage. Efforts to protect the site will benefit from further research into the size and precise distribution of the population. DPPVN would appreciate liaison, through Nusa Vogrin, with others working on this species in order to implement safeguard measures for this species, listed as vulnerable in the 1994 IUCN Red List.

Extract from report to submitted to DAPTF by Nusa Vogrin (Vransko 121, SLO-3305 Vransko, Slovenia).

Amphibian Declines in Puerto Rico

Using museum and historical records from the literature, Joglar & Burrowes (1996) searched the recorded locations, and also potential species habitats, for *Eleutherodactylus karlschmidti*, *E. jasperi* and *E. eneidae* which have not been seen since 1974, 1981 and 1990 respectively. In addition, Joglar and Burrowes also carried out long-term studies of seven populations of a further five species. *E. coqui* and *E. portoricensis* were studied for five years (February 1989 to June 1994). *E coqui*, *E. portoricensis*, *E. gryllus*, and *E. unicolor* were surveyed over four years (June 1990 to June 1994) and *E. cooki* was sampled over 33 months (October 1991 to June 1994) (Joglar *et al*., 1996).

The conclusions drawn by Joglar and Burrowes are that, of 18 endemic amphibians, three (*Eleutherodactylus karlschmidti*, *E. jasperi* and *E. eneidae*) (16.7%) may have become extinct, recently, seven (38.9%) are declining, two (11.1%) are at risk and six (33.3%) seem to be stable.

The authors cannot explain the declines, but note that all extinct or declining species show morphological or ecological specialisation and also occur at high elevations.

Specialised habitat and poor dispersal abilities may contribute to the decline of these species, but the agents of decline have not been identified. The authors note that the forested areas of the Island are susceptible to fogs, which have been proposed to concentrate and deposit contaminants. One of the regions most seriously affected is El Yunque, which is well-protected forest that is also relatively isolated, which may prevent re-colonisation after local population extinctions. El Yunque used to be home to two of the three species feared extinct, and has also witnessed declines of *E. gryllus*, *E. locustus*, *E. portoricensis*, *E. richmondi* and *E. wightmanae*. The authors note that, of the islands in the Greater Antilles, Puerto Rico has a better preserved natural environment, which leads them to speculate that amphibian populations may also be in decline on the other islands.

Joglar, R.L. and Burrowes, P.A. (1996) Declining amphibian populations in Puerto Rico. In: Contributions to West Indian Herpetology: a tribute to Albert Schwartz, R. Powell and R.W. Henderson (eds.). Contributions to Herpetology, 12. The Society for the Study of Amphibians and Reptiles, Ithaca, New York.

Joglar, R.L., Burrowes, P.A. and Rios, N. (1996) Biology of the Puerto Rican cave-dwelling frog, *Eleutherodactylus cooki*, and some recommendations for its conservation. In: Contributions to West Indian Herpetology: a tribute to Albert Schwartz, R. Powell and R.W. Henderson (ed.). Contributions to Herpetology, 12. The Society for the Study of Amphibians and Reptiles, Ithaca, New York.

Vanishing Amphibians Exhibit

The Smithsonian Institution Travelling Exhibition Service (SITES) is developing an exhibit with the Smithsonian's National Museum of Natural History. The exhibit's intent is to inform the general public about the possible causes and implications of amphibian declines and disappearances. Ron Heyer is serving as the lead scientist in developing the exhibit. The exhibition features colorful photographs, graphic illustrations, a model, maps, an interactive audio component of frog calls, and engaging text mounted on three easy-to-assemble, free-standing kiosks.

The exhibit is being produced in time to premier at the World Conservation Congress in October 1996. Educational materials and programming suggestions will be available when the exhibition begins its national tour in May 1997. The exhibit itself could be available from December 1996 through March 1997 upon negotiation. The participation fee is $575 for a six week exhibition period plus shipping costs to the next

venue. The exhibit text is in English, with discussions ongoing for a Spanish language version. Any interest in a Spanish language version should be brought to the attention of Ron Heyer immediately.

For more information, contact Jennifer Thissen: phone: 202-357-3168, extension 145, email: siwp01.sites.jennifer@ic.si.edu

Amphibians and the Changing Atmosphere

On February 24, 1996, a workshop was held in Corvallis, Oregon. It was organized by Andrew Blaustein, Dept. of Zoology, Oregon State University and chair of the DAPTF Working Group on Atmospheric and Climate Change.

Six invited speakers covered a range of topics: Adam Markham, World Wildlife Fund (*Global Climate Change and Issues for Conservationists*); Bruce Hayden, University of Virginia (*Amphibian Eden and Climate Change*); Ronald Neilson, USDA Forest Service (*Potential Impacts of Global Warming on Vegetation and Hydrology*); James Kerr, Atmospheric Environment Service, Environment Canada (*Impact of Observed Decreases in Stratospheric Ozone on UV-B Irradiance at the Earth's Surface*); John Harte, University of California, Berkeley (*Attributing population declines to Global Change: Problems and Prospects*); Maureen Donelly, Florida International University (*Potential Effects on Neotropical Amphibians*).

Adam Markham began the workshop by offering some background on the World Wildlife Fund (WWF) and then went on to explain his agency's perspective on the issue of global climate change.

The WWF is no small player in the lobbying effort to reduce and control atmospheric pollution. They have a worldwide membership of 4.7 million, and an annual budget of $27 million. Since their 1988 conference on climate and biodiversity, the WWF has continued to monitor this issue closely. This led to the publication in 1992 of the detailed report, *Some Like it Hot*, by Adam Markham, Nigel Dudley and Sue Stolton.

Today, the WWF are working with the IUCN on producing a workshop, *Managing Protected Areas in a Changing Climate*, and have launched a climate change publicity and public education campaign. The campaign targets are: 1) reduction of CO_2 emmissions by at least 20% from 1990 levels by developed countries by the year 2005; 2) promotion and widespread utilization of energy-efficient technologies in China, India, and eastern Europe; 3) identification of the species and ecosystems most vulnerable to climate change and development of strategies for their conservation.

Next, Bruce Hayden spoke on changing weather patterns and the indications that there will be big climate changes in the near future.

He pointed out that satellites are failing to detect atmospheric warming because they measure the temperature of the entire air column instead of just at the Earth's surface or at specific altitudes. Atmosphere does not respond uniformly at different altitudes. For instance, a previously stable ceiling of cooler air has recently dropped down to 30,000 feet.

Nights appear to be getting warmer. There is an increase in cloud cover in Australia and eastern North America. Storms are not as vigorous. For example, there is a decrease in cyclones and prairie storms.

Though changes are occurring, it is not clear how much we can blame anthropogenic sources for this. There is a need to look at more variables than temperature and rainfall.

Our global climate appears to be evolving rapidly and "huge" changes are anticipated. Whether, or to what degree, these effects are related to increased atmospheric CO_2 is yet to be determined.

Ronald Neilson works on vegetation modelling and is currently developing a dynamic global vegetation and landscape model using measurements such as the timing of the first and last frost of the year. His goals are: 1) to investigate biosphere feedbacks to climate change; 2) to determine the ecological effects of climate change; 3) to develop a set of ecosystem management prescriptions.

Current projections suggest that in North America subtle to profound regional biological transformations could occur in a matter of decades. For example, scenarios for the near future in the Pacific Northwest range from little change to drying and thinning of vegetation. There is the possibility that valley forests could be replaced by shrublands or chapparal-like vegetation and dry woodlands could shift up into both coastal and cascade mountains. However, more dramatic and widespread drying trends are expected in the southeastern United States.

James Kerr painted a depressing picture of ozone depletion. Current projections suggest that the loss of ozone could increase by 20% before it begins to level off. Ozone levels are then expected to bottom out in 5-10 years They will level off for several decades and begin to recover by 2050.

Ozone damaging CFC's are being replaced by less harmful chemicals (HCFC's). HCFC's are not as long-lived as the CFC's in current use. They are still damaging to the atmospheric ozone, but they will only account for 5% of ozone depletion. Unfortunately, global warming will also decrease the amount of ozone in the atmosphere.

John Harte has been looking at the effects of acidity and global change on tiger salamander populations at around 11,000 feet in the Rocky Mountains of Colorado. In this case the acidity is caused primarily by coal-burning power plants which produce sulfuric and nitric acid that enters the freshwater systems in a spring pulse. Tiger salamanders are especially vulnerable to acidity during a five-day neurolation phase of their embryonic development. The significant variables are 1) how deep is the snow pack?; and 2) when does it melt?

John also pointed out that photoperiod does not change regardless of global warming. Thus, we can expect the synchrony of many ecological events to be disrupted. His example was a hummingbird who migrates northward in anticipation of encountering the blooming larkspur on which it depends for food. However, if changing local temperatures delay the blooming of the larkspur, the hummingbirds may starve.

The workshop's last speaker was Maureen A. Donnelly, who summarized the results of her recent collaboration with Martha L. Crump. Together, they have speculated on how neotropical anurans might respond to the changes in climate that are predicted in a tropical climate change model soon to be published in a special edition of the journal *Climate Change*.

They have considered the effects of increased temperature, increased length of dry season, decreased soil moisture, and increased inter-annual rainfall variability. Additionally, they have looked at the particular vulnerability of species that are restricted ecologically and/or geographically.

Their conclusions are that neotropical frogs will be strongly affected by these projected environmental changes; particularly with respect to reproductive success, breeding periodicity and alterations in the invertebrate prey base. They also suggest directions for future research.

The general conclusions to be drawn from this workshop are that we can expect a cloudier world that is cooler at higher altitudes. The atmosphere will be wetter and morning temperatures, not afternoon, will be higher. There will be lower storm intensity and reduced soil moisture. There will be shifts in the growing season of plants and the active season of animals. For the next decade or so we should expect increasing ozone depletion before it begins to level off.

byStan A. Orchard,

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Re-survey of Yosemite Area Shows Collapse of Anuran Fauna

From May 11 to September 11 1992, biologists re-surveyed 38 sites along an east-west transect originally surveyed for vertebrates by a team from 1915 through 1919 (Grinell & Storer, 1924). In addition, other sites judged to contain suitable habitat for amphibians were also surveyed. The results of this re-survey (Drost and Fellers, 1996) document a decline in a whole anuran fauna across a large and diverse region.

Rana aurora, *R. boylii* and *Scaphiopus intermontanus* were not found at any of the previously surveyed sites. *Bufo canorus* was still present, but at fewer sites. *Bufo boreas*, a formerly widespread species, showed large declines, as did *Rana muscosa*, which was the commonest species in the original survey, but the rarest species in the re-survey. Even *Hyla regilla*, usually ubiquitous throughout its range, showed signs of decline in the high elevation sites of the surveyed transect. At 12 sites for which the original survey contained relative abundance data, the re-survey found declines in those species that were still present.

The introduced *Rana catesbeiana* was the only species to show any indication of increasing abundance (not found in the original survey). Drost and Fellers conclude that the causal factors of the declines are still not fully understood. They discount habitat destruction, since the survey covers a relatively undisturbed area. They recognise that both fish introductions and drought may account for the loss of some amphibian populations, but reject these as primary factors. Drought is rejected since it is a regular local event, even occurring during the original survey period. Fish introductions are dismissed since the temporal and geographic patterns of stocking do not match the amphibian declines. Also, the bufonid toads have suffered declines even though they breed in temporary water bodies, which cannot support fish.

Interaction of the above two factors could explain the decline in *Rana muscosa*. Fish may eradicate the large lake-breeding populations, as drought removes the smaller, remnant breeding sites. The authors also recognise that chemical contamination, from a distant source, such as pesticide drift from intensively farmed land to the West of the surveyed area, is a possibility that cannot be discounted.

Drost, C.A. and Fellers, G.M. (1996) Collapse of a regional frog fauna in the Yosemite area of the California Sierra Nevada, USA. Conservation Biology 10, (2) 414-425.

Grinnell, J. and Storer, T.I. (1924). Animal life in the Yosemite. University of California Press, Berkeley.

Mixed Fortunes of the Frog Fauna of New Zealand

New Zealand has a native frog fauna of four species: *Leiopelma hochstetteri*, *L. archeyi* and *L. hamiltoni,* which has recently been recognised as containing two distinct species. Evidence from subfossil remains suggests that New Zealand's frogs have declined since human colonisation of the Islands. Several species have become extinct, whilst the extant species have shown range reductions, to the extent that three of the four species now have very restricted distributions. Climatic factors, habitat loss and the impact of introduced species have been implicated as the causal factors of the historical declines.

New Zealand's Department of Conservation *Te Papa Atawhai* has produced a recovery plan to halt further declines. The plan establishes a 50 year goal of maintaining and enhancing existing genetic stocks and will incorporate long-term monitoring at selected sites for all native species.

This report notes that, although there has been a long-term decline in the native frogs of New Zealand, over the past ten years there is no evidence to suggest any change in the status of these species.

New Zealand is also host to at least three introduced Australian tree frogs (*Litoria aurea*, *L. raniformis* and *L. ewingi*). Curiously, two of these species, *Litoria aurea* and *L. raniformis*, have shown dramatic declines in their native Australia. The status of these species in New Zealand is currently being investigated by Bruce Waldman (Department of Zoology, University of Canterbury, Private Bag 4800, Christchurch, New Zealand, email: bw@zool.canterbury.ac.nz). Initial work suggests that although all three species have become widely established and most populations remain robust, ranges of *Litoria aurea* and *L. raniformis* are now beginning to contract in several localities, some of which comprise relatively pristine habitat.

Newman, D.G. (1996) Native frog (*Leiopelma* spp.) recovery plan. (New Zealand) Department of Conservation *Te Papa Atawhai*. Threatened species recovery plan No. 18. ISSN 1170-3806. Copies can be ordered from DOC Science Publications, Science and Research Division, PO Box 10420, Wellington, New Zealand.

The effect of UV-radiation on Alpine newts

In Austria, Alexander Nagl and Rudolf Hofer are examining the effects of UV radiation on larvae of the Alpine newt (*Triturus alpestris*).

In the laboratory, larvae proved to be extremely sensitive to UV-radiation when exposed in clear tapwater to natural sunlight or to comparable artificial UV-radiation. The experiments revealed severe skin damage (lysis of epithelial cells) and mortality after a few days of exposure.

However, in their natural habitats above the timberline, the larvae are protected by the high concentration of dissolved organic matter in the water, leading to an almost complete absorption of UV-A and UV-B radiation within the first cm of water. Small UV-specific histological effects

were detected only in very shallow habitats.

Shallow, high altitude ponds with clear water normally lack newt populations, and Nagl and Hofer speculate that both low temperature and the effects of UV radiation may limit the altitudinal distribution of *T. alpestris*.

Information taken from an abstract of manuscript in press: Contact: Alexander Nagl:

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Third Meeting Of The Central Region Working Group

ANNOUNCEMENT AND CALL FOR ABSTRACTS

The third meeting of the U.S.A. Central Division Working Group of the DAPTF will be held over the weekend of SEPTEMBER 14 AND 15 at the BAILLY TRAINING CENTER, INDIANA DUNES NATIONAL LAKESHORE. The Central Region includes Iowa, Missouri, Illinois, Indiana, and Ohio.

TENTATIVE SCHEDULE:

Saturday, September 14th will be devoted to contributed papers on amphibian decline, monitoring, and education in the Central Region (see CALL FOR ABSTRACTS, below). *Sunday, September 15th* will be set aside for discussions of the recently distributed NAAMP document: *Protocols and Strategies for Monitoring North American Amphibians*, and on how the Central Division might apply these suggested protocols in their region.

Everyone attending is encouraged to read the NAAMP protocols prior to the meeting. An electronic copy can be accessed on the Worlwide Web at:

http://www.im.nbs.gov/amphibs.html

or by ftp from:

ftp://ftp.im.nbs.gov/pub/naamp/

(or request a copy from Christopher A. Phillips at the address below).

CALL FOR ABSTRACTS: Send abstracts on amphibian decline, monitoring, education, or any conservation issues dealing with amphibians in Iowa, Missouri, Illinois, Indiana, or Ohio by 15 August, 1996 to the address below. Please include, title, presenter name, address, phone, and e-mail along with the abstract. Electronic submissions (e-mail) are encouraged and appreciated to:

Christopher A. Phillips
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Center For Biodiversity
607 East Peabody Drive
Champaign, Illinois 61820 USA
(217) 244-7077
chrisp@mail.inhs.uiuc.edu

Publications of Interest

Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. (1996). A guide to the reptiles and frogs of the Perth Region. ed., University Press of Western Australia.

deMaynadier, P.G. and M L Hunter, Jr. (1995) The relationship between forest management and amphibian ecology: a review of the North American literature. Environmental Reviews 3, 230-261.

Deuti, K. and Bharati Goswami, B.C. (1995). Amphibians of West Bengal Plains. ed., World Wide Fund for Nature - India Eastern Region, Available from - Tata Centre, 43 Chowringhee Road, Calcutta, 700016, India.

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Hecnar, S.J. (1995) Acute and chronic toxicity of ammonium nitrate fertilizer to amphibians from Southern Ontario. Environmental Toxicology and Chemistry 14, (12) 2131-2137.

Means, D.B., Palis, J.G. and Baggett, M. (1996) Effects of slash pine silviculture on a Florida population of flatwoods salamander. Conservation Biology 10, (2) 426-437.

Péfaur, J. E. & Sierra, N. M. (1995) Status of *Leptodactylus labyrinthicus* (Calf Frog, Rana Ternero) in Venezuela. Herpetological Review 26, 124-127.

Pounds, J.A. and Fogden, M.P. (1996) Conservation of the golden toad: a brief history. British Herpetological Society Bulletin 55, 5-7.

Ranjit Daniels, R.J. and Anuradha, G. (1996) Ambient temperature influences the population count of frogs. Cobra 23, 4-9.

Russell, R.W., Hecnar, S.J. and Haffner, G.D. (1995) Organochlorine pesticide residues in Southern Ontario Spring Peepers. Environmental Toxicology and Chemistry 14, (5) 815-817.

White, A.H. (1995) Disappearing frogs. Australian Zoologist 30, (1) 48-56.

Magazine article on declining amphibians and threatened biologists:

Wilkinson, T. (1996). Utah ushers its frogs toward oblivion. *High Country News*, No. 19 (May, 27, 1996), 1 & 10-13.

New DAPTF International Coordinator

As of August, John Baker has left the post of DAPTF International Coordinator. His duties have been taken over by myself, John Wilkinson. The DAPTF office will continue to be based at the Open University, UK, so the postal address, telephone and fax numbers will remain the same. We have, however, set up a dedicated DAPTF e-mail address:

DAPTF@open.ac.uk

All further electronic mail should be sent to this address as the old e-mail number will shortly cease to operate. Please inform any of your colleagues (who may not be immediately aware) of this change.

I look forward to working with DAPTF members worldwide, and will attempt to provide support in any way I can. I would like to take this opportunity to thank John Baker for his work at the DAPTF office over the last few years.

John W. Wilkinson,

DAPTF International Coordinator, August 1996.

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