

FROGLOG

IUCN/SSC Declining Amphibian Populations Task Force

December 1994 No 11

Task Force Priorities

Ron Heyer, in consultation with the Task Force Board of Directors and the chairs of the US and Canadian Working Groups, has prioritized Task Force areas of research. Through its Working Groups, the Task Force should continue its efforts to answering two questions:

- 1) Why are declines happening, and is the effect local, regional or global?
- 2) Where have declines occurred and are they still happening?

The Task Force needs to find answers to both of these questions, and both should be addressed. However, the first demands an urgent response because an understanding of causal factors of declines is needed if mitigating measures are to be recommended.

Standard Methods for Amphibians

The DAPTF Board wishes to commend the editors (W. Ronald Heyer, Maureen A. Donnelly, Roy W. McDiarmid, Lee-Ann C. Hayek and Mercedes S. Foster) and the 47 authors who produced the new book entitled 'Measuring and Monitoring Biological Diversity. Standard Methods for Amphibians.' This 364-

page, fully illustrated and indexed book issued early in 1994, is the first in a series of comprehensive works describing standardised methods for measuring biological diversity. DAPTF congratulates the editors and authors on the publication of this highly practical and valuable book, which will be useful to amphibian biologists worldwide.

All Working Group Chairs, have been supplied with copies of this book for use by their groups.

DAPCAN IV

Fifty Canadian scientists and wildlife biologists and Ron Heyer attended the fourth annual meeting of the Task Force on Declining Amphibian Populations in Canada (DAPCAN), held October 1-3 at the Museum of Man and Nature in Winnipeg, Manitoba.

The conference, organized by Bill Preston (Museum of Man and Nature) and Ron Larche (Manitoba Natural Resources), was co-sponsored by the Museum of Man and Nature, the Manitoba Department of Natural Resources, Environment Canada, Canadian Wildlife Service (Prairie and Northern Region), and Ducks Unlimited's Institute for Wetland and Waterfowl Research. Henry Wilbur was the invited keynote speaker. The following abstracts have been compiled:

Monitoring amphibians in Ontario using volunteer observers, C.A. Bishop & K.E. Pettit; *Environmental fate and effects of organophosphorous insecticides on amphibians in Ontario, Canada*, C.A. Bishop, et al.; *Climatic and landscape changes versus population decline and conservation: the chorus frog and*

the mountain dusky salamander in Quebec, Joel Bonin; *Measuring the health of frogs in agricultural habitats subject to pesticides*, J. Bonin et al.; *Fluctuations in abundance and age structure in three species of frogs (Anura: Ranidae) in Algonquin Park, Canada, from 1985-1994*, R.J. Brooks & L.J. Shirose; *Estimated status of Manitoba amphibians based on criteria used by the Nature Conservancy's Conservation Data Centre Network*, J. Duncan et al.; *Fowler's toads ups and downs*, D.M. Green; *Regional Dynamics of amphibian pond communities in southwestern Ontario*, S.J. Hecnar; *The effects of logging on stream breeding amphibian populations*, K.A. Kelsey; *Disease Investigation, pathological findings and impact on anuran populations in southern Quebec*, M. Ouellet et al.; *Critical environmental stressors in adult anura: ultraviolet radiation and hydrothermal regulation*, J.J. Roth & R. Westland; *Diurnal and seasonal calling patterns of some Manitoban amphibians: opportunities to piggyback on bird surveys*, P. Taylor.

Copies of the abstracts are available on request from the Task Force Office.

Ronald Brooks (University of Guelph) conducted a workshop on how to estimate fluctuations in population numbers.

Results to date are inconclusive as to whether a global agent is responsible, in whole or part, for amphibian population declines in Canada. Factors related to human overpopulation, environmental contamination, and habitat destruction have clearly been shown to be detrimental to amphibians generally, though the severity of the effect varies from species to species. There is general agreement on the importance of population monitoring over many years and with the widest

geographical scope in order to distinguish long-term population trends from short-term fluctuations. Local populations can be greatly affected by weather and predation. Research results indicate that the health and size of individual frogs at transformation may be good indicators of developing problems when broader data are lacking.

Amphibian research in Canada is thinly funded; thus the work of the DAPCAN relies almost exclusively on the volunteer efforts of researchers, wildlife managers and members of the interested public. The time, energy and material expenses required to enlist and co-ordinate a volunteer force is considerable. DAPCAN's achievements are almost entirely attributable to dedicated individuals who recognize the merits of this research. However, long-term funding commitments must be found if this organization is to survive and accomplish its aims. Fund-raising will now become a greater priority.

David Green, retiring National Co-ordinator for DAPCAN, is the principal editor of the upcoming book, *Amphibians in Canada: Population Status and Decline*, which will detail the results of the first three years of the DAPCAN Task Force's activities. Publication is expected in 1995.

It is the intention of the DAPCAN Task Force to hold its next meeting in Toronto in September or October of 1995. The details are being worked out to meet in conjunction with the Centre for Endangered Reptiles' annual symposium and with the members of the North American Amphibian Monitoring Program.

US Central
Group Meeting

On September 9th to 12th the US Central Group held its second meeting at Bailly Training Facility, Indiana Dunes National Lakeshore. 24 papers were presented, and these will be compiled into a book *The Status of Midwestern Amphibians*, to be edited by Mike Lannoo. Selected abstracts:

Ten to Eleven Year Population Trends in Two Pond-Breeding Amphibian Species

S.A.Cortwright, Department of Biology, Indiana University Northwest, Gary, IN 46408.

Long-term population studies of amphibians are essential in order to understand natural population dynamics. Further, consideration of species' attributes allows an initial insight into the likelihood that the population features predominantly natural versus anthropogenic dynamics. Two species from south-central Indiana are the focus of this report. Red-spotted newts (*Notophthalmus viridescens*) feature chemical protection against predators and also produce submerged eggs. The former should make newts less vulnerable to fluctuations in predators, and the latter makes newts less vulnerable to changes in ultraviolet-B intensity. Green frogs (*Rana clamitans*) feature some chemical protection in the egg/larval stages, but their surficial eggs may be vulnerable to changes in ultraviolet-B radiation. Census data taken over ten to eleven years from 35 ponds suggests no downward trend in either species. However, population fluctuations were sometimes great in this little-disturbed ecosystem, which should help to interpret population trends in other studies.

Hormonal Response to Acute Stress as a Biomarker for Chronic Stress in Larval *Ambystoma tigrinum*

D.L. Larson (Northern Prairie Science Center, Jamestown, ND 58401) & A.J. Fivizzani (Dept. of Biology, University of North Dakota, Grand Forks, ND 58202).

Measures of suitability of habitat for a species have traditionally relied on relative population abundance across its range. Recent work shows, however, that local populations may be maintained primarily through immigration. Although individuals may survive in these sink habitats, the chronic stress of inhabiting sub optimal habitat may result in reproductive rates that are too low to sustain the population. It would be useful to measure population health when considering amphibian habitat suitability.

Biomarkers (defined as physiological, biochemical or histological responses in organisms to environmental stressors) hold promise as a method of assessing the health of populations. Biomarkers are commonly used in toxicological studies of response to contaminants

in the laboratory, and their use under field conditions is increasing. Some biomarkers indicate exposure or reaction to specific chemicals, whereas others indicate a general stress response. The latter can provide an index of a population's health, and thus the overall suitability of the habitat in question. Several of these general stress indicators are potentially measurable with minimal disturbance to the population. Tests for serum glucose concentrations, various blood cell counts, and stress hormone levels, for example, require only that blood be collected from a representative sample of the population.

In this study we examined the potential of the stress hormone corticosterone. Objectives of the study are (1) to develop a non destructive technique for assessing hormonal response to acute stress in the field and (2) to assess the relationship between acute and chronic stress responses, under the hypothesis that individuals inhabiting degraded environments would experience chronic stress and thus show a diminished response to acute stress.

Larval *Ambystoma tigrinum* from 24 different populations were trapped in funnel traps. Blood samples were taken from half of the larvae immediately. The other half of the samples were exposed to an acute stress situation (confinement in a 500 ml bottle for 30 minutes) before blood was taken. Corticosterone levels were significantly lower in larvae from which blood was drawn immediately, than in those subjected to acute stress. Thus the capture technique did not obscure the acute stress response.

The stress response of larvae taken from populations adjacent to land supporting crops was inversely related to the percentage of crop land. In populations that were not close to crop land there was no relationship between the stress response and any measure of land use. The acute stress response was unrelated to any aspect of water chemistry. These results, whilst not conclusive, are suggestive of the potential use of corticosterone levels as biomarkers for chronic stress.

The meeting was sponsored in part by the US Fish and Wildlife Service, The National Biological Survey and the National Park Service. The meeting also included a

workshop, sponsored by National Biological Survey Biologists, Sam Droege and Diane Larson, which is summarized as follows:

A Proposed North American Amphibian Monitoring Program Executive Summary

An international workshop was held in conjunction with the US Central Group meeting, to investigate the possibility of developing a program for monitoring North American amphibians. During that meeting it became clear that developing such a program was feasible, but its scientific credibility would be questionable unless a number of methodological issues were clarified prior to any implementation. Consequently, the process of developing a continental monitoring program begins here with a list of research needed in 1995 to address methodological issues. An appeal to recruit such research, and create a group that will help track and coordinate that research is made below.

The broad goal of a North American Amphibian Survey is to: "Develop a statistically defensible program to monitor the distributions and abundance of amphibians in North America, with applicability at the state, provincial, ecoregional, and continental scales."

No single monitoring technique can adequately sample all species of amphibians in North America. Four techniques were identified, which, if implemented in concert, would include most species. Two of these techniques had good potential for inclusion in a continental-scale volunteer effort: calling amphibian surveys and larval surveys. Two other techniques, terrestrial salamander surveys and desert amphibian surveys, are equally important to develop, but have potentially greater technical and logistical problems to overcome.

Four principal research needs for 1995 were identified. Each requires detailed investigations into the cost, feasibility, precision, and bias of the proposed measures. For further details see the following "Call for Help" section, request a copy of the 8 page research needs document from one of the listed authors, or download a copy of the research needs document (PHIBNEED) from the anonymous ftp sites at ftp.its.nbs.gov (165.83.32.5) in the

/pub directory or at keck.tamu.edu (165.95.41.233) also in the /pub directory.

Research Needs:

1. Validating Calling Amphibian Surveys.
2. Tadpole and Salamander Larvae Identification Material.
3. Validating Larval Surveys
4. Desert Amphibian Surveys

A meeting both to report on the results of 1995 amphibian monitoring techniques and to research and to design the North American Amphibian Monitoring Program will be held in Toronto in conjunction with the joint Canadian Declining Amphibian Task Force and the Centre for Endangered Reptiles annual symposium. Details on meeting dates and publication of proceedings are still being decided.

Call to the Amphibian Research and Conservation Community for Help with Researching Amphibian Monitoring Techniques

The purpose of this initiative is to:

1. Locate biologists who are already researching the amphibian monitoring techniques outlined in the research needs document or who would be interested in modifying their field plans in 1995 to do so.
2. Encourage those biologists to, when practical, decrease duplication of effort by coordinating their research efforts.
3. Encourage groups already using some of these techniques to help investigate issues of costs, observer training, program precision, and bias.
4. Encourage groups interested in starting new programs to consider starting their efforts by participating in some of the investigations.
5. Provide statistical review and consultation for designing new surveys and experiments.

Should you wish to help and you are working in any of the following areas, then please contact the listed biologist.

Volunteer Management/

Training/Bias Christine Bishop. Phone: 905-336-4968 Fax: 905-336-6434 email: u063@csx.cciw.ca

Calling Amphibian Surveys Sam Droege. Phone 202-482-3925 Fax 202-273-0825

Email DROEGES@MAIL.FWS.GOV

Tadpole and Salamander Larvae Identification Material Roy McDiarmid. Phone: 202-357-2780 Fax: 202-357-1932,

Email: mnhvz056@sivm.si.edu

Validating Larval Surveys Doug Johnson. Phone: 701-252-5363 Fax: 701-252-4217

Email: Johnsondh@mail.fws.gov

Desert Amphibian Surveys David Bradford. Phone: 702-798-2681 Fax :702-798-2208

Email msdffb@vegas1.las.epa.gov

Terrestrial Salamander Surveys.

Brad Shaffer Phone: 916-752-2939 Email: hbshaffer@ucdavis.edu

For each of these groups we are compiling lists of those biologists actively working in this area and those who would like to be involved. By January 15th we will summarize current research plans, identify the gaps between planned activities and research needs, and present a strategy to fill those gaps.

If you would like to be on the email list for the North American Amphibian Program please email Sam Droege at:

DROEGES@MAIL.FWS.GOV

Mike Lannoo

US National Coordinator

In Nevada, The
Odds are
Against
The Amargosa
Toad

The Biodiversity Legal Foundation has petitioned the United States Fish and Wildlife Service (USFWS) for the listing of the Amargosa toad (*Bufo nelsoni*) as an endangered species in the United States, including a request that the USFWS consider an emergency listing for the toad. The petitioner contends that the species is biologically endangered due to a dangerously low population range, continued habitat destruction, and inadequate government programs.

Less than 40 years ago, thousands of this species inhabited the Oasis Valley in Southern Nevada. Today, this endemic population probably consists of fewer than 100 individuals. Only 30 adult and juvenile toads have been observed along the Amargosa River and at surrounding springs in the Oasis Valley this year. In the last decade alone, despite the knowledge that populations of this species were in dramatic decline, toad populations and habitat have suffered significant degradation. Some of the factors believed to adversely affect the toad and its habitat include grazing, off-

road vehicle use, grading for flood control, and modification by heavy equipment for the development of commercial enterprises. The introduction and existence of non-native predators, such as catfish and crayfish, pollution and diversion of spring water have also directly affected toad populations.

'This is one of the most imperilled unprotected amphibians in the United States,' said Jasper Carlton, Executive Director of the Biodiversity Legal Foundation. 'This species may go extinct in the wild if the US Fish and Wildlife Services do not grant immediate protection under the Endangered Species Act.'

Carlton is also concerned about the effect of political trends and economic interests on amphibians, as less glamorous wildlife causes. He is concerned that research into these species will be hampered if they are not listed, since funding will tend to be concentrated on those that are already listed. He also perceives a trend favouring captive rearing and release schemes rather than habitat protection measures.

In Carlton's opinion, the three species/populations most in need of listing are: the Amargosa toad, the western boreal toad *Bufo boreas boreas* (southern Rocky Mountains population) and the great basin population of the spotted frog (*Rana pretiosa*). In addition the Wyoming toad (*Bufo hemiophrys baxteri*) 'could become extinct in the next couple of years'. Jasper Carlton expects that litigation will take place within the next year.

The Biodiversity Legal Foundation is a US, non-profit organisation dedicated to the preservation of all native species, natural communities and ecosystems. The organisation is based in Boulder, Colorado (PO Box 18327, Boulder, CO 80308-1327), and has been at the leading edge of efforts to protect the ecosystems of threatened and endangered species in the US.

**Summer Course
in Vertebrate
Ecology and
Evolution**

A course in 'Vertebrate Ecology and Evolution', with an emphasis on amphibian ecology and evolution will be offered by Michael J.Lannoo,

Professor. June 5th - July 7th, 1995. Scholarships to cover tuition and room and board available. To receive information or to register write: Iowa Lakeside Laboratory, Iowa State University, Ames, IA 50011 (515) 294-2488. Enrolment limited to ten students.

**Amphibian and
Reptile
Conservation
Newsletter**

This is a new, monthly, herpetological conservation newsletter to inform readers of conservation efforts worldwide. Subjects covered are wildlife trade, captive population management, general articles of interest in conservation biology, research summaries, species accounts, original research, breeding projects, animal husbandry, natural history, ecology, behavior, country reports, legislative news, short communications and travel. Most importantly it is for both the amateur and professional alike. The ARC newsletter is intended to form a closer union, communication, and co-ordination of private sector conservation with those of the professional conservation community. Contact: Amphibian & Reptile Conservation, 2255 North University Parkway, Suite 15, Provo, Utah 84604-7506, USA. Home Tel: (801) 373-2549. Voice Mail: (801) 371-8457. Fax: (801) 373-0695
Email : Craig@Infonaut.com or:
Craig.Hassapakis@m.cc.utah.edu

**Publications
of
Interest**

Devillers, J., & Exbrayat, J.M (eds.) (1992). Ecotoxicity of chemicals to amphibians. Philadelphia Reading Paris Montreux Tokyo Melbourne: Gordon and Breach Science Publishers. ISBN 2-88124-872-1.

Dodd, C.K. Jr. Reptiles and amphibians in the endangered longleaf pine ecosystem. Our Living Resources 1994. For further details contact C. Kenneth Dodd, Jr., National Biological Survey, 7920 NW

71st Street, Gainesville, FL 32653, USA.

Fog, K. (1988). Reinvestigation of 1300 amphibian localities recorded in the 1940s. Memoranda, Societas pro Fauna et Flora Fennica, 64: 134-135.

Kucken, D.J., Davis, J.S., Petranka, J.W., Smith, C.K. (1994) Anakeesta Stream acidification and metal contamination - effects on a salamander community. Journal of Environmental Quality 23 (6) 1311-1317.

Rowe, C.L. & Dunson, W.A. (1994). The value of simulated pond communities in mesocosms for studies of amphibian ecology and ecotoxicology. Journal of Herpetology 28 (3) 346-356.

Kutka, F.J. (1994). Low pH effects on swimming activity of *Ambystoma* salamander larvae. Environmental Toxicology and Chemistry. 13 (11) 1821-1824.

**New DAPTF
Working Group
Chairs**

Canada

After three years in the post, David Green has handed over the role of National Coordinator to:

Stan A. Orchard
Biology Section, Royal B.C. Museum
675 Belleville Street, Victoria,
B.C. V8V 1X4, CANADA
Phone 604-387-3649
Fax 604-387-5360

The following new chairs have been appointed in the Canadian Group:

Regional Coordinator Eastern Canada

Carolyn N. L. Seburn
Seburn Ecological Services, 930
River Rd. South
RR#4 Kemptville, Ontario K0G 1J0
CANADA
Phone 613 258-6142

Regional Coordinator Western Canada

Andrew Didiuk
Canadian Wildlife Service
115 Perimeter Rd., Saskatoon,
Saskatchewan S7N 0X4, CANADA
Phone 306-975-4005
Fax 306-975-4089

Provincial Coordinator Manitoba

Ron Larche
Manitoba Dept. of Nat. Resources
PO Box 14, 1495 St. James St.

Winnipeg, Manitoba R3H 0W9
CANADA

Phone 204-945-7740

Fax 9456-3077

FROGLOG

Newsletter of the World Conservation Union (IUCN), Species Survival Commission (SSC) Declining Amphibian Populations Task Force (DAPTF). Available to interested parties upon request.

Partial funding for FROGLOG is provided by donation from:

Frog's Leap Winery, P.O. Box 189,
Rutherford, CA 94573.

John Baker, Editor
Department of Biology, The Open University, Walton Hall, Milton Keynes, MK7 6AA, United Kingdom.
Phone 0908 652274 (+44 908 652274 if ex-UK)
Fax: 0908 654167 (+44 908 654167 if ex-UK)

E-mail: j.m.r.baker@open.ac.uk

FROGLOG is available on the World Wide Web at the following URL:

http:

[//acs-info.open.ac.uk/info/other/](http://acs-info.open.ac.uk/info/other/)

FROGLOG-11.html