FROGLOG

IUCN/SSC Declining Amphibian Populations Task Force

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UV-B Linked to Declines

Researchers at Oregon State University, Corvallis, Oregon, USA, have published an article in the March, 1994, (Vol.. 91, pp. 1791-1795) issue of the Proceedings of the National Academy of Sciences entitled, "UV repair and resistance to solar UV-B in amphibian eggs: A link to population declines." A.R. Blaustein, P.D. Hoffman, D.G. Hokit, J.M. Kiesecker, S.C. Walls, and J.B. Hays, authors of the study, have provided evidence to implicate a global effect as an agent of amphibian declines . Their abstract follows:

"The populations of many amphibian species, in widely scattered habitats, appear to be in severe decline; other amphibians show no such declines. There is no known single cause for the declines, but their widespread distribution suggests involvement of global agents increased UV-B radiation, for example. We addressed the hypothesis that differential sensitivity among species to UV radiation contributes to these population declines. We focused on species specific differences in the abilities of eggs to repair UV radiation damage to DNA and differential hatching success of embryos exposed to solar radiation at natural oviposition sites. Quantitative comparisons of activities of a key UV-damage-specific repair enzyme, photlyase, amona oocytes and eaas from 10 amphibian species were reproducibly characteristic for a aiven species but varied > 80-fold amona the species. Levels of photolyase aenerally correlated with expected exposure of ea~s to sunliarht. Amona the froa and toad species studied, the hiahestactivity was shown by the Pacific treefroa *(Hyla* rq7i/la~, whose popubtions are not known to be in decline. The Western toad *(Bufo boreas*~ and the Cascades froa *(F~ana* casca~, whose populations have declined markedly, showed sianificantly lower photolyAse levels. In field experiments, the hatchina success of embryos exposed to UV radiation was significantly greater in H. re~ than in *R. cascadaeand ~. boreas.* Moreover, in *R. cascadae* and *B. boreas,* hatching success was greater in regimes shielded from UV radiation compared with regimes that allowed UV radiation. These observations are thus consistent with the UV-sensitivity hypothesis."

The Endocrine Connection

In a paper presented at the Second World Congress of Herpetology in December 1993, Robert C. Stebbins of the University of California, Berkeley, USA, challenged participants to consider how recent research on contaminant effects might apply to the problem of declining amphibian populations. The following is a summary of his presentation:

"Many local impacts, anthropogenic and climatic, are often noted in amphibian declines, but they frequently fall short of fully explaining many declines. Furthermore, declines are occurring in seemingly pristine areas, many seem to be somewhat in synchrony, and are distributed globally. Might there be a pervasive, perhaps atmospheric source of damage? Certain chemicals of the industrial area may qualify as a primary culprit. These are chemicals that intrude into developmental processes, blocking intercellular communication, inducing the production of enzymes that break down hormones, and that mimic naturally occurring estrogens - chlorinated chemicals such as DDT, PCBs and others. Many are now worldwide in distribution, transported by air, water, animals and commerce. Since the midde 1940s contamination from many of them has ~own exponentially. Sorne accumubte and are lon~-bstin~ in the environment. Perhaps we are now seein~ biotic responses on a brge scale. wlth amPhib ians (among vertebrates) in the lead. These chemicals misdirect cell differentiation and ~rowth even when they exist in the physical environment at levels frequently re~arded as low (one part per million) because of bioma~nificafion and the relatively low concentration at which naturally occurrinq hormones circulate in the blood and produce their effects. Effects of these endocrine disrupters can be far reachin~. They include thyroid dysfuncbon, decreased fertility, birth deformities, effects on sexual development, and dama~e to immune systems.

There are characteristics of amphibians that miqht make them particularly vulnerable to the effects of these endocrine intruders: 1) Toxicants are absorbed throu~h their hi~hly permeable skin as well as their di~estive tract. 2) In anuans, tissues in the tadpole's tail presumably provide much of the ener~y necessary for metamorphosis. Since many xenobiotic chemicals are lipophilic, sequestering in fatty tissues, any sur~e in the break-down of fat in the tail or elsewhere mi~ht be accompanied by a release of chemical contaminants that could seriously interfere with the hormone driven si~nals of metamorphosis. 3) When emer~ln~ from hibernation and/ or estivation to reproduce, amphibians, particularly in the Temperate Zones under~o great swings in ener~y demand drawin~ heavily on fat reserves. Contaminants released at this time mi~ht be particubrly dbma~in~ if the emer~in~ animal's Immune system has been stressed by low temperatures, desiccation, or other factors. 4) Females draw upon their fat reserves in yolking their e~gs, thus mi~ht release contaminan~s into the fuel supply for the developin~ embryo.

I wge that these topics, several of them somewhat speculative, be subjected to research scrutiny."

Dr. Stebbins, with his co-author Dr. Nathan Cohen, will be publishin~ a new book this year enbtled, "A Natural History of Amphibians," by Princeton University Press, in which they devote a chapter to the problem of declines and elaborate on the "Endocrine Connection" hypothesis summarized here.

Rebted readh~:

Colborn, T. and C. Clement, Eds. 1992. Chemically-induced alterabons in sexual and functional development: the wildlife/human connecbon. Princeton Sci. Pub. Co. 403 PP-

Feature: Virus Studies

The relevance of infectious disease particularly viral disease, to declining amphibian populations (DAP) has evoked increasing interest lately. In the following feature article, Dr. D. Earl Green, DVM, Chair of the Disease and Pathology Working Group, provides four reviews of recent studies on viral infections in amphibians, Dr. Alvin W. Smith DVM, presents an overview of the distinguishing characteristics of viral disease; and Dr. Green closes with a summary of the implications of these studies and suggests some new directions and approaches for further research.

REVIEW OF THE PRESENTATION: Disappearing Australian Rainforest Frogs: Have We Found the Answer? R. Speare, K. Field, J. Koehler and K. McDonald. 2nd World Congr. Herpetol., Adelaide, 3 January 1 994, In this unpublished and unscheduled presentation, Dr. Speare gave preliminary results of virologic studies on amphibian declines of three (possibly four) rainforest species from Big Tableland in northern-most Queensland. Populations of *Taudactylus acutirostris, Litoria rheocda,* and L. *nannotis* were considered abundant 18 months earlier, but in October 1992 sick and dead frogs were common. Declines were considered precipitous and occurred in a three month period. Along a 100 meter transect in October 1992, 72 T. *acutirostris* were observed- in November and December 1992, nine and two were found respectively. Declines for L. *rheocda* were similar. Clinical signs in sick frogs were principally neurological: 1) lethargy, 2) slowed response to tactile stimulation, and 3) undisturbed frogs sat abnormally with their limbs only partly retracted. Occasional dramatic neurological signs included: 1) frogs with extended hindlimbs, 2) loss of righting reflex, 3) when handled, frogs had convulsive-like fits characterised by fully rigid extension of hind limbs, flexion of forelimbs, and often with trembling of all limbs; and 4) rigidity lasted up to five minutes and was followed by death, flaccidity, or apparent recovery to the former lethargic state. Less common non-neurologic signs included general pallor suggestive of anemia, minute skin ulcers, and haemorrhages into the skin, muscles and eye. At necropsy, frogs had remarkably few lesions. Histologically, affected frogs showed vacuolation in the brain, particularly in neurons around ventricles, and foci of necrosis (death of cells) in the liver, kidneys, spleen, and occasionally in the intestinal mucosa and skin. Red blood cells appeared smaller and rounder than normal and had pyknotic and eccentric nuclei. Although bacteria were cultured from 78% of the affected frogs (including *Aeromonas hydrophila,* the agent of red-leg disease), the authors concluded the bacteria were secondary invaders or opportunistic infections. Using immunohistological techniques, *Ranavirus* antigen was detected in organs associated with the foci of necrosis. The authors noted that these lesions and findings were consistent with an infection by Bohle Iridovirus (BIV) (genus *Ranavirus,* of the iridovirus family), which was isolated in 1989 near Townsville, Queensland, from *Lymnodynastes ornatus.* Dr. Speare stressed the tentativeness of any conclusion that these frogs died from *Ranavirus* infection until they are able to: 1) duplicate results on other specimens, 2) repeat tests for *Ranavirus* antigen; 3) see the virus using transmission electron microscopy on other specimens, 4) isolate the virus in fish cell lines; and 5) reproduce the disease experimentally.

REVIEW OF THE ARTICLE: Unusual Mortality Associated with Poxvirus-like Particles in Frogs (Rana temporaria) *.* A. A . Cunningham, T.E.S. Langton, P.M. Bennett, S.E.N. Drury, R.E. Gough, J.K. Kirkwood. Vet. Rec. 133:141-142. 1993.

Dr. CunninGham et al. examined 53 frogs taken from 10 of 222 sites having adult frog mortalities in the UK in 1992. At dissection a variety of lesions were found including reddening of the skin (49%), skin ulcers (42%), bleeding into the stomach or intestines (34%), bleeding into muscles (49%), complete or partial necrosis of digits or limbs (28%), and thinness mostly presenting as lack of fat stores (64%). Poxviruslike particles were detected on negative staining electron microscopy of skin samples from 48 of 50 frogs. Histolo~ically, the skin lesions of epidermal hyperplasia, necrosis, and ulceration were considered typical of poxvirus lesions as reported In other classes of vertebrates. The authors noted that 144 of 222 reoorts of frog mortalities in the UK in 1992 included descriptions of skin lesions similar to those examined by them. This report was the first description of poxvirus-like disease in amphibians.

REVIEW OF THE ARTICLE: First Isolation of Calidvirus from ReDtiles and Amphibians. A.W. Smith, ~.P. Anderson D.E. Skillin~, J.E. Barlou~h, P.K. Ensiey. Am. J. Vet. Res. 47:1718-21. 1 986.

Calicivirus was isolated from four taxa of healthy and diseased reptiles and an amphibian, Bell's Horned Fro~ *(Ceratophrys ornata),* all of which were captive, zoolo~ical specimens. Virus cultures were performed on Vero cell lines, and all isolates were serolouically indistinguishable, hence, the virus agent was named reptile calicivirus Crotalus type 1 (RCV Cro-1). Although calicivirus was isolated from two dead C. *ornata* no consistent Glinical si~ns, ~ross lesions or histolo~ic findin~s were detected. However, both frogs had necrotizing interstitial pneumonia, which the authors declined to attribute to virus infection. The authors commented on the chronic carrier state which may occur in calicivirus-infected ectotherms and emphasized that further studies are warranted. The authors did not attempt to fulfill Koch's postulate using amphibians, but were partially successfull with two rattlesnakes. They noted two features of caliciviruses which may have some correlation to DAP: 1) the capability to infect multiple classes of vertebrates, and 2) most have been found to be pathogenic when closely studied.

REVIEW OF ARTICLES: Cytopathologic Observations and Epizootiology of Frog Erythrocytic Virus in Bullfrogs *(Rana catesbeiana. J.* Gruia-Gray and S.S. Desser. *J.* Wildlife Dis. 28(1):3441. 1992
Ultrsstructursl, Biochemical and Biophysical Properties of an Erythrocytic Virus of Frogs from Ontario, Canada. J. GruiaGray, M. Petric, and S. Desser. *J.* Wildlife Dis. 25(4):487-506. 1989.
In these two articles, Dr. Gruia-Gray et al. characterize the viral properties, natural hosts and epizootiology of frog erythrocytic virus (FEV) in *Rana catesbeiana, R. septentrionalis* and *R.* clamitans in Ontario, Canada. Although no Bullfrog tadpoles were found naturally infected by FEV, up to 62% of juvenile Bullfrogs were infected. In mark and recapture studies over five years, 9% of uninfected and 4~6 of infected frogs were recaptured, suggesting the infection may be the cause of some mortalities. Adult Bullfrogs greater than 131 mm and *R. pipiens* were resistant to infection, although it was unknown whether these frogs had recovered from earlier infections by FEV w *R. pipiens* intraerythrocytic virus, respectively. Experimental infections were attempted only in *R. catesbeiana* and *R. pipiens.* The authors note that FEV is an exceptionally lar~e iridovirus and resembles other amphibian viruses (namely *R. pipiens* intraerythrocytic virus,*"Pirhemocytons p.*," *" Toddias p.* ," tadpole edema virus ITED], and frog virus 3 [FV3]) and fish viruses (piscine erythrocyte necrosis [PEN] virus, Iymphocystis v~rus, and Nereis iridescent virus [NIV]). Excellent cytdogic and electron microscopic photographs were shown of FEV.

A PRIMER ON INFECTIOUS DISEASE
by A.W. Smith, DVM

"As worldwide DAP are examined more closely, information emerges on the presence of disease agents, including viruses, and their possible implication in these declines. Thus, it was thought useful to briefly outline some general concepts and common manifestations of infectious diseases that should be taken into account whenever the overall health of an animal population comes under consideration. Exceptions occur but these need not detract from the overall common rules outlined here.
1) Each population of vertebrates has its burden of disease agents. These are usually somewhat species specific and normal hosts usually cope well, i.e., entire populations are

not wiped out. However, diseases spilling into unnatural hosts often cause tremendous damage.
2) As a species comes under increasing scrutiny, the usual sequence of disease agents to be described over time is as follows: Metazoan parasites Protozoan parasites, bacterial/funaai pathoaens and finally viral a~ents. Vinuses are the most difficult to identify and work with.
3) Diseases tend to occur cyclically often driven by the number of susceptible animals in a population and the intensity of exposure. Youn~ animals are aenerally more susceptible to diesease. Infected individuals then die or become resistant, completin~ the cycle. Cycle times may differ by years or decades.
4) "Pisease" is often multif~ctorial, i.e. more than one pathogen may be present however, the elimination of a primary pathogenmay preventthe dsease. Viral diseases alone usually do not kill but can dama~e tissw or suppress immunity givir~g entry and opportunity to secondary disease a~ents, usually bacterial or funaal.
5) Viral diseases are often immunosuppressive. Usually, if an animal with infectious disease has a hi~h white cell count, it's bacterial; if the counts are low, it's viral.
6) Viruses may spread vertically (from parent to offspring) and can be dfficult to distir~guish from aenebc dseases.
The rapid spread of a disease such as influenza is easily understood where a new variant occurs at one point, then spreads by human carriers worldwide. Amohibian declines may not be as easily exdained in terms of infectious disease.
However, a calicivirus has been isolated from six species of ectotherms, includina amphibians, and three species of marine mammals, including ~rey whales, which can spew massive numbers of virus into marine waters. Some birds have become infected, and in their miarations throuah wetlands worldwide mayrapidly disseminatethis virus. Influenza~ike vln~ses may also spread quickly but they are probably not as readly adaDtable to ectothemls.
This is not to suagest that caliciviruses are invdved in DAP. This a9ent is simdy used as an examDle to show how one virdo~ist with his personal bias can support a hyoothesis that a vin~s new to most amphibians could spread rapidly worldwide, causing increased mortality especially in the young.
The major point to be made is this. If infectious diseases are i~nored, the ridde of amphibian declines may never be solved. If they are not ignored, new information on disease manifestations and their overall impact on population dynamics and ecology will be greatly increased. In turn, this will markedly exoand the database needed to devdop rational research and mana~ement strate~ies for maintainin~ overall ecdo~ical dlversity and balance."

ARE VIRUS INFECTIONS CONTRIBUTING TO AMPHIBIAN DECLINES7

by D. Earl Green, DVM

"The four viral studies reviewed here may offer important clues on worldwide DAP. The two most recent studies by Cunnin~ham et al. arld Speare et al. propose that two viruses are implicated in DAP. Two studies found potentially new species of viruses in amphibians one study provides excellent descriptions of clinical sions in fro~os involved In DAP, two articles describe the ~ross and histolo3k lesions in sick and dead amphibians, and one study provides excellent epizootido~y of a virus infection, while another two provide a few tantalizin~ epizootiolo~ic clues.

The companion editorial by Dr. Smith offers a keen insiuht into virus infections in ~eneral. It is worth restatino that most virus infectlons, as studied in endotherms tend to have a limited ran~e of susceptible hosts. Usually the vinus-host relationship is not life-threatenin~ to the host, but when the virus spreads to additional hosts, which may be closely related taxa or different classes of vertebrates, the effects on the naive individual and population can be devastatin~. Gruia-Gray et al. imply there is a low mortality associated with fro~ erythrocytic iridovirus (FEV) infection in three Canadian ranids. However, Speare etal. in studies of Australian fro~s suggest an iridovinus was the etido~y of DAP in three or four sympatric species. Althou~h it is hi~hly speculative at this time to su~est the source of the iridovinus in the Australian study, it is worth emphasizin~ that not all, and perhaps not every, iridovinus will prove to be as mild an infection as Gruia-Gray et al. report in their Canadian studies of FEV.

Gruia-Gray et al. report that up to 62% of juvenib *Rana catesbeiana* are infected by FEV, while or~ly 1-3% *of R. septentnonalis* and *R. damitans* are infected. Why is this? Do these latter ranids more often develop fatal infections or debilitabnq imfections which increase chances of predation, and hence, remove the animals from the studied population7 Speare et al. offer insi~ht into the pathdo~ic chan~es associated with an iridovirus-like infection of Australian froqs. Gross and histdo~ic examinations of wild (and perhaps experimental) fro~s infected by FEV are needed for companson to the Australian studes and to cornpliment the excelknt published data on endemic FEV infections. Similarly, we await additional complimentary studies by Cunnin,qham et al . on the British poxvirus-like agent, especially the virus cultures, experimental transmission studies, and histolo~ical photomicro~raphs of the poxvirus-like skin lesions.

Smith et al., in a bss than recent publication, report on a new calicivirus in captive reptiles and amphibians. This study is important because it challen~es the pneral concept that viruses usually have a limited host ran~qe. Is it possible that this concept is more applicable to viruses of endotherms than those of ectothemms? Caliciviruses are unusual for their capability of infectin~ endo therms and ectotherms. Docaliciviruses of fish and reptiles commonly infect amphibians?

Similarlv,dofishiridoviruses infect amphibians? Recent experimental studies in Australia and Europe with amphibian iridovinuses su~qest sheatfish *(Silurus ~lanis),* rambow trout *(Oncorhynchusmykiss'*~ and barramundi s c~nfer) are readily infected by Bohle Iridovirus and FV3, sometimes with devastin~ results (Enriquez et al. 1993, Moody and Owens, 1994). But what of the reverse situation7 Upon release, could hatchery-raised fish carry iridoviruses to populatiwns of wild amphibians? I am not aware that these questions are bein~ addressed in field or experimetnal studies. Hence, the Smith et al., Speare et al., and Gruia-Gray et al. studies su~est some challen~in~ lines of investiqatiwn into the DAP problem.

Cunnin~ham et al. show what can be done when teams of specialists work on a DAP problem. A potentially new virus infection ha$ been found associated with DAP in the UK. Their preliminary findin~s are both excitin~ and worrisome. Excitin~ because a potentially new infectious a~ent was found, and almost fw the lookinq. Worrisome because it's unclea~ whethe~ the vi~us has always been present, w is a newly introduced disease, and whether the a~ent can be controlled. More studtes are expected from this team in coming months, but clearly, their studies re-emphasize the need for virdoqical studies of DAP worldwide.

Since the mid 1 930s, when Lucke's herpesvirus in *Rana pipiens* was one of the first viruses described and studied thorou~hly, amphibian viroloay seems to have lan~uished. The results of these four research ~roups mark a resur~e in interest in amphibian viruses and SU9~est they may be important to the DAP problem. These studies have set standards of excellence and challen,qe us to continue searchin~ with open minds for causes of amphibian declines.

Finally, a few comments on amphibian dia~nostic examinations. With amphibian diagnostics in its infancy, and with possible hints of cross-infectivity of piscine, amphibian and repblian vlruses, two important concepts may be emerging: 1) invesbqations of DAP should include examinations of non declinin~ populations of indi~enous and introduced ectotherrns, and 2) DAP may be approached diaqnostically as both a pisane case and a terrestrial animal case. Fish health laboratories wwk with ectothemmic aquatic w~anisms, while most veterinarians are trained in terrestrial endotherm diseases. Althou~h clinical veterinarians, veterinary patholo~ists and virologists can offer much assistance to investi~abons of DAP, let us also call upon fish heatth technicians fish pathotos~sts and virdoqists. The observabons and findin~s of each team of dia~nosticians will be complementary and, potentially, more insi~htful into the etioloqies of amphibian declines."

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Moody N.J.G., L. Owens. 1994. Experimentai demonstration of the pathoqenicity of a fro~ virus, Bohle iridovinus, for a fsh species, barramundi *Lates calcarifer.* Dis. Aquat. Orq. 18:95-102.

Report from the Chair

The fdlowina report is from Bob Johnson, DAPTF Chair.

"I would like to beain by thankinQ recently departed Task Force Cowdinator, Jim Vial, on behalf of the DAPTF Board of Directors and members, for the tremendous amount of enerQy he devoted to accomplishin~a the aoals the Task Force set befwe Itself. Jim collated volumes of reports and overcame the inertia of dealina with the alobal scientific community. He provided a focus for a membership drawn from around the world and we owe him a areat debt of aratitude. We can be assued that amphibian populations around the world have benefited from Jim's dedication to his science. On behalf of the Board, I have sent to Jim an wiainal limited edition print of *Litoria chlons* in appreciation of his accomplishments.
I would also like to take this opportunity to express my Qratitude to the many Task Force members who have volunteered their time to make this effort possible. There would be NO Task Force without the contributions made by WorkinQ Group Chairs/Coordinators, their colleaaues, and individual contributors.

rapid dissemination of information.

7. There was a warnin~a that we should not overextend our case and that we may not yet be comfortable with the extent of our knowledae. *F~OGLOG* should document firm cases of environ mental imDacts and publish or summa rize well documented instances of de clines. Where possible, factors respon sible for declines should be identified.

8. Provide a more comprehensive, stan dardized protocol for patholoaical dia~ nostic techniaues and specimen collec tion to be used by field workers to obtain samples from die-offs.

9 . It was suaaested that there was merit to comparina extinction sites with per sistence sites and to use rearessions to identify likely causes.

10. We need to be mwe proactive and provide a report on just what we know and can do about physioloaical impacts and mortalities associated with pesti cide sDrayinQ.

11. Those specialists that can address specific issues related to amphibian de clines need to work toQether to focus available expertise.

12. Throuah E-mail and computer infor mation networks such as GOPHER, imple ment access to data on Task Force participants' areas of exDertise, taxa studied, etc. A means of disseminatin~ this information to those without access to a computer needs to be explored.

13. Make available a biblioaraphic

record of published literature relevant to amphibian declines and Task Force objectives.

14. Finally, the relationship of the Task Force to other IUCN Specialty Groups and actions plans was discussed. It was emphasized that Workina Group Chairs should be in contact with existina IUCN Specialty Groups.

As Chair, I appreciated the frank and lively discussion of Workina Group needs and su,aaestions for improvinQ Task Force operatlons. You can be assured that your comments have been circulated to the Board and will be communicated to the new Coordinator. I must say that the Board displayed a ~-eat deal of enerQy and enthusiasm and is eaaer to meet the challenaes of providina a framewwk within which the causal aaents of amphibian declines can be pursued."

Chile (41 soecies), Peru (314 species) UruQuay ~40 species) and Venezuela (209 species).

* Amon~ the ~enera that have known declines *(Atdopus, Melanophryniscus Colostethus, Dendrobates, Hylodes, Telmatobius, Batrachophrynus* and *Centrolene),* most are extremely dependent on water bodies.
* There was a re-evaluation of the concept of declines as applied to amphibians. Concern was expressed about the discrepancy between official ~overnrnent classifications of endanQerment for amphibians and those of the C)APTF (Red List cateQories).
* Reasons fw declines were posed for now only as hypotheses. However, one of the most cetain reasons for local declines is over-exploitation. Human consumption of *Telmatobius arequipensis, T. marmoratus,* and *~atrachophrynus maaostomus* in Peru and *Caudiverbera caudiverbera* in Chile is depletinQ their former larQe populations. Anofher clear reason is extraction and exportation, as reported for Chile . In 1 98 5, 2 36 anurans were exported while in 1992 there was an exportation of 1 00,000!
* Another reason Qiven for declines is the introduction of non-native fauna: *Xenopus laevis, F~ana catesbeiana* and *Tnfunus sp.* in many places over the cwltinent, especially in Chile, Peru and Brazil, and rainbow trout (*Oncorhynchus mybss)* alonq the Andes.
* There was a recommendation to ministries and universities to devote more resources to determinina causes that mi,qht be affecting viable amphibian populabons. The Task Force will continue workina toward that purpose and will expand its network of Latin American herpetoloaists and other interested people.

Meetin s in Adebide:

On ganuary 6, 1 g94, followin~ the Second World Con~ress of Herpetolo~y in Adelaide Australia, the DAPTF Board of Directo;s met alon~ with Workin~ Group Chairs and other scientists with an interest in Tssk Force objectives.

Following the Open Meetinq, the Board
considered these issues:
1. Members of IUCN/SSC are re-appointed every three years. For the Task Force, our first three year term ended with the IUCN General Assembly held in Buenos Aires in January, 1994. There was a discussion of possible candidates for the Coordinator's position and for new appointments to the Board. Any new appdntments will be published in FROGLOG after approval by SSC Chair Geor~e Rabb and the Board of Directors.
2. The meetin~ also focused on an operational framework that expands the role of scienbsts with proven experbse in amphibian biolo~y.
3. Unfortunately, the Board did not address the need for additbonal fund raising acbvities. This must be addressed by the new Board as fundin~ for cooperative and multi-disciplinary research The lll Latin An projects in areas of documented declines was identified as a hi~h priority.
4. There was unanimous a~reernent ~hat the issue of amphibian declines requires a public, political and scienbfic campai~n of awareness.
5. We were reminded that we are not workin~ in isolation from other issues of species in decline and that we need to indude and incorporate a wider audience.
6. ***FROGLOG*** should be maintained, increasin~ review of scientific studies for

rapid dissemination of information.
7. There was a warninq that we should not overextend our case and that we may not yet be comfortable with the extent of our knowled~e. *FROGLOG* should document fimm ca#s of environmental impacts and publish or summarize well documented instances of declines. Where possible, factors responsible for declines should be identified.
8. Provide a more comprehensive standardized protocol for patholo~icai dia~nostic techniques and specimen collection to be used by field workers to obtain samples from die-offs.
9 . It was suq~ested that there was merit to comparin~ extinction sites with persistence sites and to use re~ressions to identify likely causes.
10. We need to be more proactive and provide a report on just what we know and can do about physiolo~ical impacts and mortalities associated with pesticide sDrayin~.
11. Those specialists that can address specific issues related to amphibian declines need to work to~ether to focus available expertise.
12. Throu~h E-mail and computer information networks such as GOPHER, implement access to data on Task Force participants' areas of expertise, taxa studied, etc. A means of disseminabn~ this informabon to those without access to a computer needs to be explored.
13. Make available a biblio~raphic record of published literature relevant to amphibian declines and Task Force objectives.

14. Finally, the relabonship of the Task Force to other IUCN Specialty Groups and actions plans was discussed. It was emphasized that Workin~ Group Chairs should be in contact with existin~ IUCN Specialty Groups.
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III CLAH: A Synopsis

The lll Latin American Con~qress ofHerpetolo~y (lll CLAH) brouqhttoqether over 500 Neotropical researchers at the University of Campinas, Campinas, $ao Paulo, Brazil, from 12 to 18 December 1993, to discuss 250 papers or panels dealinS~ with South American herps.
Most relevant to the Task Force was the workshop on "Declination of South American Amphibian Populations," chaired by J.E. Pefaur.
Hi~hli~hts of tne workshop follow:
* Updated lists of amDhibians were submitted for Araentina ~172 *snecies),*
Chile 141 species), Peru (314 species) Uruguay (40 species) and Venezuela 1209 species).
* Among the genera that have known declines *(Atelopus, Melanophryniscus, Colostethus, Dendrobates, Hylodes Telmatobius, Batrachophrynus* and *Centro/enc),* most are extremely dependent on water bodies.
* There was a re-evaluation of the concept of declines as applied to amphibians. Concern was expressed about the discrepancy between official ~overnrnent classifications of endan~erment for amDhibians and those of the DAPTF (Red List cateqories).
* Reasons for declines were posed for now only as hypotheses. However, one of the most cetain reasons for local declines is over-exploitation. Human consumption of *Telmatobius arequipensis, T. marmoratus,* and *Batrachophrynus macrostomus* in Peru and *Caudiverbera caud;verbera* in Chile is depletin~ their former lar~e populations. Another clear reason is extraction andexportation, as reportedfor Chile. In 1985,236 anurans were exported, while in 1992 there was an exportation of 100,000!
* Another reason given for declines is the introduction of non-native fauna: *Xenopus laevis, Rana catesbeiana* and *TntuNs Sp.* in many places over the continent, especially in Chile, Peru arld Brazil, and rainbow trout *(Oncorhynchus myhsst* alon~ the Andes.
* There was a recommendation to ministries and universities to devote more resources to determinin~ causes that mi~ht be affectin~ via ble amphibian populatlons. The Task Force will continue workin~ toward that purpose and will expand its network of Latin American herpetolo~ists and other interested people.

Submitted by Dr. Jaime Pefaur DAPTF Coordinator for South Amenca and member of the Board of Directors. To obtain copies of pro~ram abstracts contact: Dr. Adao J. Cardoso, Executive Secretary lll CLAH, DeDt. of Zool°~K Univ- of Campinas, S. P., Brazil. Fax: 55-192-3~-~124.

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Loralei Saylor, *Editor*

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