

CBSG/WAZA
AMPHIBIAN EX SITU CONSERVATION
PLANNING WORKSHOP



El Valle, Panama
12-15 February 2006

FINAL REPORT



Photos courtesy of Paul Crump, Houston Zoo.

A contribution of the Conservation Breeding Specialist Group.

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Palm Beach Zoo at Dreher Park
Parco Natura Viva - Italy
Perth Zoo
Philadelphia Zoo
Phoenix Zoo
Pittsburgh Zoo & PPG Aquarium
Point Defiance Zoo & Aquarium
Prudence P. Perry
Randers Regnskov Tropical Zoo
Ringling Bros., Barnum & Bailey
Robert Lacy
Rotterdam Zoo
Royal Zoological Society - Antwerp
Royal Zoological Society - Scotland
Royal Zoological Society - South
Australia
Saitama Children's Zoo
San Antonio Zoo
San Francisco Zoo
Sedgwick County Zoological Society
Taipei Zoo
The Living Desert
Thrigby Hall Wildlife Gardens
Tiergarten Schönbrunn - Zoo Vienna
Toledo Zoological Society
Twycross Zoo
Union of German Zoo Directors
Utah's Hogle Zoo
Wassenaar Wildlife Breeding Centre
Wilhelma Zoo
Woodland Park Zoo
Zoo Frankfurt
Zoologischer Garten Köln
Zoologischer Garten Zurich

\$500 and above

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Akron Zoological Park
Banham Zoo and Sanctuary
BioSolutions Division of SAIC
Cotswold Wildlife Park
Dutch Federation of Zoos
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Givskud Zoo
Granby Zoo
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Knoxville Zoo
Knuthenborg Safari Park
Lincoln Park Zoo
Lisbon Zoo
Little Rock Zoo
Naturzoo Rheine
Odense Zoo
Oregon Zoo
Ouwehands Dierenpark
Riverbanks Zoological Park

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Swedish Association of Zoos
Wellington Zoo
Welsh Mountain Zoo
Wildlife World Zoo, Inc.
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Zoo Madrid
Zoologischer Garten Rostock

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Arizona - Sonora Desert Museum
Birmingham Zoo
Bramble Park Zoo
Edward & Marie Plotka
Emporia Zoo
Lee Richardson Zoo
Mark Barone
Montgomery Zoo
Racine Zoological Society
Sacramento Zoo
Svenska Djurparksföreningen
Tokyo Zoological Park Society
Topeka Zoo, Friends of
Wildlife Safari - Oregon

\$100 and above

African Safari - France
Alex Rübel
Aquarium of the Bay
Bighorn Institute
Brandywine Zoo
Central Zoo Authority - India
Chahinkapa Zoo
Ed Asper
Elias Sadalla Filho
Folsom Children's Zoo
International Center for Birds of Prey
Lion Country Safari, Inc.
Miami Metrozoo
Nigel Hewston
Poznan Zoo
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Steinhart Aquarium
Steven J. Olson
Tautphaus Park Zoo

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Darmstadt Zoo
Miller Park Zoo
Oglebay's Good Children's Zoo
Peter Riger
Plzen Zoo
Safari Parc de Peaugres - France
Stiftung Natur-und Artenschutz in den
Tropen
Touro Parc - France
Wuppertal Zoo

Thank You!
June 2006

CBSG/WAZA AMPHIBIAN EX SITU CONSERVATION PLANNING WORKSHOP

Final Report

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Section 1
Introductory Materials

Executive Summary

From 17-19 September 2005, the IUCN hosted an Amphibian Conservation Summit in Washington, DC. The world's amphibian authorities from academia, zoos, government, veterinary medicine, and other diverse disciplines convened to conceptualize an Amphibian Conservation Action Plan (ACAP), outlining general responses required in the fields of research, assessment, conservation, and rapid response to stem widespread global amphibian extinctions. The IUCN/SSC Amphibian Specialist Group (ASG), the organization overseeing implementation of the ACAP, specifically tasked the IUCN/SSC Conservation Breeding Specialist Group (CBSG) with implementation of the *ex situ* aspects of ACAP's goals.

From 12-15 February 2006, CBSG and WAZA hosted an Amphibian *Ex Situ* Conservation Planning Workshop in El Valle, Panama. Unlike the prior meeting in DC, this group called upon only those amphibian biologists with expertise in the issues surrounding captive maintenance of amphibians. Fifty such people from 14 countries representing every amphibian-inhabited continent divided into four working groups to develop strategies for **Organization** of the *ex situ* community, **Best Practices** for husbandry and quarantine, developing objective criteria for **Species Selection**, and conceptually organizing **Rapid Response Programs**.

Major Conclusions

Organization: An administrative structure was proposed in which the *ex situ* community would liaise with the larger Amphibian Specialist Group (ASG) through an advisory board consisting of representatives from CBSG and WAZA, among others. The advisory board would, among other tasks, develop and monitor strategies for implementing the *ex situ* part of the initiative in coordination with the *in situ* component, direct fundraising activities, and ensure excellent communication with all stakeholders. The advisory board and the WAZA executive director would oversee the activities of an Amphibian Program Officer, who would in turn provide advice to implementing partners in the *ex situ* community regarding knowledge and technology transfer, breeding programs, regional coordination, and species priorities.

Best Practices: Standards are provided for the *ex situ* housing and maintenance of amphibians and recommendations made for fostering community involvement. These husbandry standards are designed to ensure the highest quality of care for captive amphibians, to minimize the transmission of disease between captive species, and to prevent the introduction of exotic pathogens into novel environments. They are intended to be general husbandry guidelines. Specific protocols will be determined by the individual species selection process.

Species Selection: A Decision Tree was constructed to quantify the appropriateness for a given species to be included in an *ex situ* program. Phase One of the Decision Tree ensures there is justification for an *ex situ* program. It consists of three fundamental questions with “yes” or “no” answers. These questions should be applied to the taxon under consideration, answering each honestly and objectively. Phase Two of the Decision Tree takes those species that have ‘passed’ Phase One and attempts to prioritize them, i.e., with limited resources (space, staff, money etc.) which species should have *ex situ* programs established ahead of others. It takes the form of a series of questions with weighted scores. The total score for a species indicates how ‘important’ an *ex situ* program for the species is in relation to others. Some questions may not be straightforward to answer and will require consultation with colleagues, taxonomic experts and other individuals/groups working with the species. Phase Three of the Decision Tree considers

the practical feasibility of initiating and maintaining an *ex situ* program once justified and considered a priority.

Rapid Response Programs: Rapid response programs deliver basic protocol and capacity to countries facing amphibian crises. These protocols must be flexible in nature to respond to crises deriving from causes as disparate as disease, habitat loss, contamination, climate change, etc. This will require identification of secure funding and dedicated staff to devise and implement the response program defined below. The purpose of these programs is to establish basic *ex situ* amphibian operations during the suggested time required while permanent capacity for *ex situ* operations is developed in the range country. This purpose directly addresses the common problem of delays in conservation action that result from insufficient capacity in range countries, and ties directly to commitments to build permanent capacity in those countries. Key elements of these programs will include identifying and training of national citizens and agencies in all aspects of *ex situ* programs, for example: husbandry, veterinary, management, fund raising, and public education. Successful implementation of programs will require fluid communication at all levels between IUCN-ASG, national governments, and local citizens in affected areas.

The Working Group Reports compiled into this single document represent the *ex situ* community's plan to address the *ex situ* conservation components of the ACAP. The *ex situ* community will collectively form an ASG Thematic Working Group (yet to be named) and will implement this plan. We anticipate the next steps will be workshop participants presenting these results for consideration at their regional meetings, followed shortly by regional species selection workshops in collaboration with ASG/GAA members.

List of Attendees

NAME	INSTITUTION	CONTACT
Andrés Acosta	Pontificia Universidad Javeriana - Colombia	andres.acosta@javeriana.edu.co
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Luis Coloma	Pontificia Universidad Católica del Ecuador	lcoloma@puce.edu.ec
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Introductory Questions

At the beginning of the workshop, each participant was asked to identify their personal goals for what they hoped to achieve at the workshop and what they thought they could contribute to the workshop. Responses are recorded below.

Personal goals

To have you and all your institutions support a worldwide coordinated amphibian conservation program by contributing to get this initiative going (with your knowledge and your institutions' money) and to involve as many zoos as possible in joint *in-situ/ex situ* programs.

To define a clear commitment with Cali Zoo and our common project.

To find action steps for support and implementation of the amphibian conservation action partnership.

To work out through consensus here at this workshop what Bristol Zoo can contribute towards amphibian conservation and learn: How? What? When? How much? Who?

To develop clear conservation goals for amphibians in SE Asia that can be achieved through the Singapore Zoo.

To get a clear and achievable direction that my institution can participate in to achieve a significant contribution to conserve and raise awareness of the plight of amphibians in SE Asia.

Anything I can based on field and *ex situ* experience on other projects and to broaden my understanding of the amphibian *ex situ/in situ* project.

To meet other stakeholders in the amphibian crisis and to help create a new approach to conservation action.

To learn as much as possible about how to develop action steps.

To participate in finding a way forward in amphibian conservation around the world and to learn from others ways in which my country, South Africa, can help save its amphibian species.

To establish Omaha Zoo as a contributing partner in amphibian conservation and to make new friends with you fine people.

To learn more about what my institution can do to help amphibian conservation.

To form linkages with other individuals and institutions with similar goals; become informed of world wide efforts and capacity in this issue; make a meaningful contribution to the outcomes of the workshop; take home the outcome and influence the Australian regional efforts.

To learn about issues with which I am not familiar.

To ensure the captive response to declining amphibian crisis is integrated, goal-oriented, and research-based.

Learn what's being done around the world with *ex situ* amphibians, what more can be done, and what people believe should be done.

To see a meaningful transition from *ex situ* amphibian conversation to *ex situ* amphibian conservation.

To develop a clear, specific, realistic and time-bound, commonly agreed *ex situ* plan for amphibian conservation globally.

To learn as much as I can about amphibians, to learn from the experiences of the people here, and to learn how we can implement conservation in our institutions.

To find out more about what is being done at present and future strategies for amphibian conservation within the private sector.

To demonstrate the private sector's potential for contributing to *ex situ* conservation and convince participants of our capabilities.

To assist with the design of captive breeding programs with research design and with ideas to further fundraising efforts to sustain the movement.

To reach consensus on a strategic species selection and prioritization process enabling and empowering a coordinated international program for amphibian conservation.

To use the expertise present here at this workshop to expand my own knowledge and apply it effectively to the global vision; to flesh out the vision of in-country *ex situ* management.

What I hope to contribute

My knowledge and organizational abilities and knowledge of the limitations of our organizations.

Knowledge of amphibian species breeding and management.

Experience with conservation partnerships to assist in the implementation of the Amphibian Conservation Action Partnership.

Given virtually no conservation experience of any kind (and little amphibian experience), I can contribute enthusiasm and common sense. (I hope!)

A perspective of how amphibian conservation may be initiated in Singapore and SE Asia.

My knowledge of the kind of facilities available in SE Asia and also the level of expertise, or lack of it, in SE Asia.

Anything I can of my zoo education, outreach and (modest) field experience.

To communicate a sense of urgency, scope and scale of action required to save amphibians.

My experience as a zoo director and educator in a region in which amphibians are being directly affected by all factors.

My participation, local information, enthusiasm, and to form linkages to other organizations involved with amphibians.

A very positive attitude and jokes.

Better understanding of the role of my institution in amphibian conservation and the potential influence and funding that it might bring.

My expertise and experience with *in situ* conservation programs and developing recovery plans for amphibians.

Provide some input into priorities.

Share some experiences in attempts at achieving goal-oriented, research-based captive responses to conservation problems.

My experience with *ex situ* amphibian conservation; possibly brainstorm new and exciting multidisciplinary initiatives.

Information and strategies for amphibian disease management, and control for *ex situ* facilities and amphibian recovery efforts.

My experience from work with DAPTF, previous CBSG meetings and the Global Amphibian Summit.

Help people achieve a clear, specific, realistic and time-bound, commonly agreed *ex situ* plan for amphibian conservation globally.

To give our visitors an opportunity to know the situation that is happening now.

To share our efforts at Sandfire Dragon Ranch in California in captive breeding of various species in large quantities for distribution and sales. We believe that these efforts in general amphibian husbandry, filtration, nutrition and habitat caging can benefit the conservation work for threatened and endangered species.

Experience in keeping and breeding reptiles and amphibians for more than 50 years.

I feel I can contribute in the areas of program design and fundraising through my captive amphibian breeding projects both in the lab and in private facilities.

Experience in multidisciplinary amphibian conservation amphibian activities, institutional collection planning and species selection.

Knowledge about working with in-country institutions to create an *ex situ* amphibian conservation facility.

Background Information

A third of the world's 6,000 amphibian species are threatened with extinction. The status of many more is unknown but believed to be imperiled, bringing the percentage of threatened species potentially as high as 50%. This is significantly more than any other group of organisms: by comparison, 12 % of bird species and 23 % of mammal species are threatened. With recent amphibian extinctions exceeding 120 species and one entire family already lost, this trend represents the greatest extinction crisis in the history of mankind.

From 17-19 September 2005, the IUCN hosted an Amphibian Conservation Summit in Washington, DC, where the world's amphibian authorities from academia, zoos, government, veterinary medicine, and other diverse disciplines convened and drafted an Amphibian Conservation Action Plan (ACAP). This document outlines general responses required in the fields of research, assessment, conservation, and rapid response to stem additional amphibian losses.

The IUCN/SSC Amphibian Specialist Group (ASG) has specifically tasked the IUCN/SSC Conservation Breeding Specialist Group (CBSG) with implementing the *ex situ* aspects of ACAP's goals. While the *ex situ* community can (and does) contribute to some extent to all four areas of ACAP activity, it will carry major responsibility in two areas: conservation and rapid response. Our goal at the Panama meeting was to articulate how the global *ex situ* community will address these responsibilities in a coordinated way.

The following presentations were given (see CD):

- Update on history/current status of amphibian crisis (Joe Mendelson)
- Post-DC: ASG, ACAP, and the secretariat (Bob Lacy)
- Role of *ex situ* community in ACAP (Kevin Zippel)
- Mass production facility: Sandfire Dragon Ranch (Bob Mailloux/Mike Ready)
- Total integration: Amphibian Research Center (Gerry Marantelli)

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Section 2
Working Group

ORGANIZATION WORKING GROUP

Group members

Adrian Benedetti (Reporter), Onnie Byers, Peter Dollinger, Maria Clara Dominguez, Alejandro Grajal (Reporter), Biswajit Guha, Alberto Mendoza, Eric Miller; Ingo Pauler, Gordon McGregor Reid (Facilitator), Alex Rubel (Recorder)

Preamble

We envision a WAZA-led effort with multiple partners that offers a decentralized approach with backup sites. This effort complies with the priority species selection process in this plan, complies with husbandry best practices, and CBD guidelines [Article 9 of CBD reads as follows: ‘a) adopt measures for the *ex situ* conservation of components of biological biodiversity, preferably in the country of origin of such components; b) establish and maintain facilities for *ex situ* conservation of and research on plants, animals, and micro-organisms, preferably in the country of origin of genetic resources.’]

We feel that a variety of efforts of different scales should be applied. There is a proposal in favor of facilities within the biological range and in-range country. But we recognize the value of off-site backup facilities, large and small. We are concerned that large multi-species facilities can be vulnerable to catastrophic events, e.g., pathogen derived. *Ex situ* efforts should strive for a balance between size of facility, economics and vulnerability, including risk assessment. We acknowledge that this *ex situ* effort is a stopgap measure and issue a call to ASG and other components of ACAP to strive for a rapid solution for the remediation of ultimate and proximate causes of the amphibian crisis.

Key result area: Organization and Other Politics

1. Objective: Organize and coordinate *ex situ* efforts

- a) *Strategy*: Determine name/identity for *ex situ* effort. Identify groups that coordinate responses of zoos and the private sector. Define the strength of the different organizations.
- b) *Strategy*: Determine relationship with ASG (advisory board, see proposed diagram relationship below)
- c) *Strategy*: Determine roles of CBSG, WAZA and other partners

Roles of the amphibian *ex situ* program advisory board:

- report to and advise ASG
- liaise with other ASG components
- liaise with the *ex situ* experts
- develop and monitor strategies for implementing the *ex situ* part of the initiative in coordination with the *in situ* component
- develop the *ex situ* component of ACAP and propose revisions as necessary
- communicate wider ASG knowledge and ACAP priorities to *ex situ* group
- develop policies to support *ex situ* plans and programs
- coordinate fundraising activities
- propose policies to international bodies and lobby for their adoption
- the role of the board is to advise on program implementation matters, not to direct
- provide terms of reference and procedures for conflict resolution

- ensure excellent communication with all stakeholders.

Roles of WAZA:

- employ coordinator(s) mid-term
- provide the resources for coordination
- provide support to coordination efforts and the advisory board
- motivate members and others to participate
- market the program, brand
- fundraise
- coordinate and implement training
- lobby for policies in international bodies.

Roles of CBSG:

- employed coordinator to be transferred mid-term to WAZA
- lead the advisory group
- link the *ex situ* program to ASG/IUCN
- facilitate workshops for implementation of *ex situ* projects
- support training
- support and facilitate knowledge transfer
- support global fundraising initiatives as GEF.

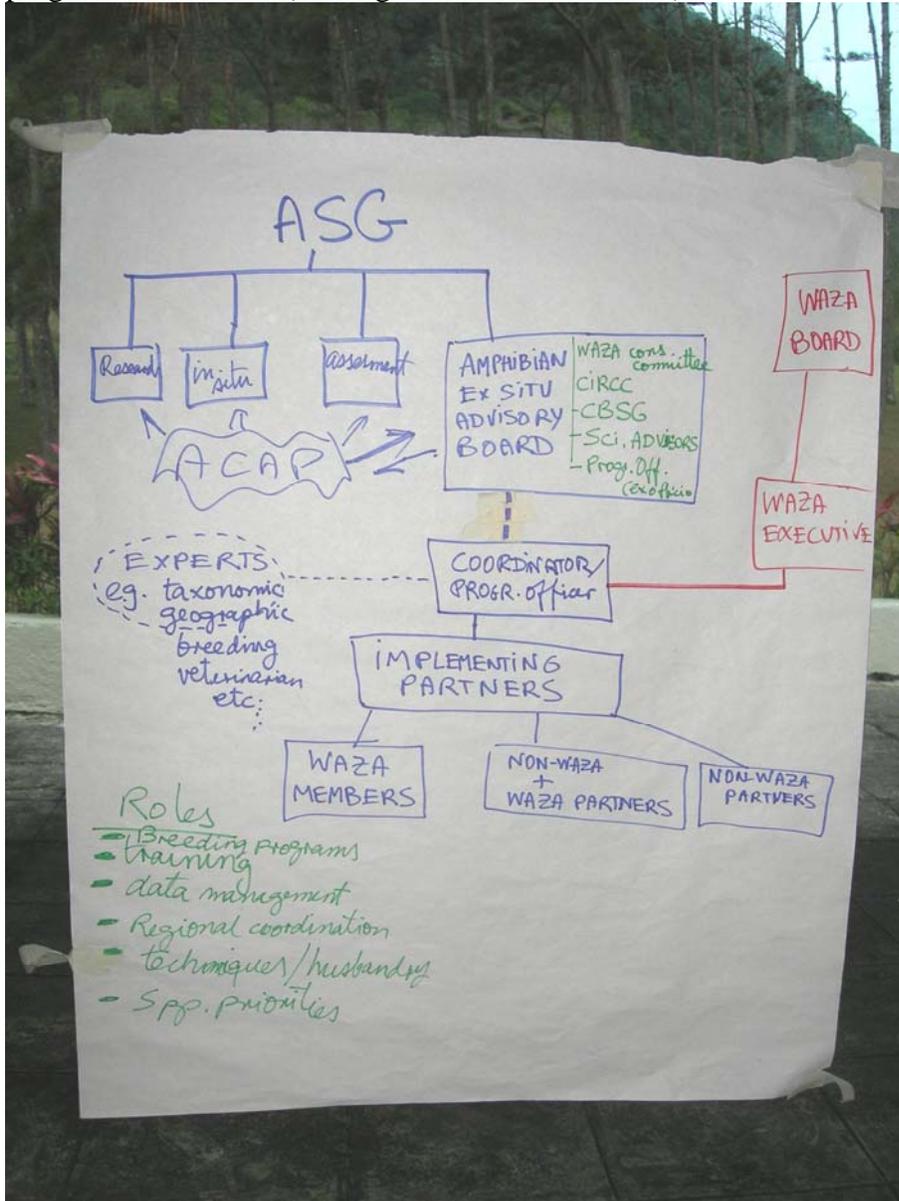
Roles of the coordinator:

- report to WAZA executive
- brief the amphibian *ex situ* advisory group re programs
- coordinate experts from all fields and expertise, literature (list) and programs (databank)
- organize and provide advice to implementation community regarding
- knowledge and technology transfer
- training
- breeding programs
- regional coordination (including TAGs)
- husbandry techniques
- species priorities
- data provision and databank.

Immediate Action: Issues to be resolved regarding coordination between Onnie Byers (CBSG), Gordon Reid and Peter Dollinger (WAZA):

- budget
- job description of coordinator
- coordinator's employment
- employment transfer of coordinator timeline
- place to work for coordinator
- working program for coordinator for one year (along the budget)
- decision committee for coordinator's activities for the moment (Gordon, Onnie, Peter)

d) Strategy: Propose/draft responsibility chart of Amphibian *Ex Situ* Advisory Board, consisting of CBSG, WAZA Conservation Committee, CIRCC, Regional TAG chairs, science advisors, program coordinator. (See organization chart below.)



e) Strategy: Propose/draft communication system with regions:

- Amphibian Species Survival Plans, where they exist, should be represented on the Advisory Board.
- To use the *Amphibian Ex Situ* Advisory Board to identify hotspots in conservation needs for which the coordinator finds partners.
- We recognize that there are regions with endangered species programs with taxon advisory groups, while other regions may have other approaches to conservation at the habitat or ecosystem level, or none at all. In the latter case, a species based approach may be

inserted in a national priority.

2. Objective: Propose framework/plan for financial support

a) *Strategy*: Strive for coordination of fundraising.

1st year: Gordon, Onnie, Peter (follow-up on pledges, etc.)

Subsequent operational/coordinator budgets: proposed by WAZA, funds raised within the zoo community to cover the running budget.

Assign coordinator to develop budget and five-year financial plan for *entire ex situ* amphibian program.

Account for in-kind expenses and cash contributions for matching purposes.

Tap governments as funders.

b) *Strategy*: Look for large/small grant opportunities.

c) *Strategy*: Work with ACAP partners (secretariat) to develop GEF proposal.

d) *Strategy*: Work with ACAP partners (secretariat) to develop other large grants to support ACAP.

e) *Strategy*: Priority commitment to support in-range efforts.

3. Objective: Support Marketing and PR initiatives (WAZA, etc.)

Refer to WAZA (marketing committee)

a) *Strategy*: Use the extinction crisis as framework reference BUT emphasize proactive positive actions by the *ex situ* initiative and contributions by partners (having a WAZA master website with specific links to partners and their programs).

Action: WAZA magazine will dedicate an issue to the amphibian crisis (with chapters by geographic region)

Suggest each member/partner publishes at least one story/year (if they have regular publications)

Encourage each member/partner to develop interpretative sign about amphibian crisis

Coordinate a global publicity campaign on amphibian crisis

Encourage members/partners to contact media about amphibian crisis.

Encourage appropriate environmental education campaigns for different audiences.

b) *Strategy*: Encourage WAZA branding of projects.

c) *Strategy*: Avoid the word “captive”, use *ex situ*.

d) *Strategy*: Maximize cooperation with off-range countries.

4. Objective: Assure regional and international coordination to facilitate animal movements

a) *Strategy*: Engage licensing authorities in exporting and importing countries.

Action: WAZA to place this on agenda for CITES (Animals Committee), Lima, (July 06).

b) *Strategy*: Engage IUCN/UN support for permits, waiver of fees.

Action: WAZA to direct proposal to CBSG.

c) *Strategy*: Address animal ownership issues

Action: Refer to TAGs

Specific guidelines to be developed by WAZA regarding access to genetic resources and benefit sharing.

Off-country programs ask for action and commitment in-country and whenever possible, these off-country programs will support capacity building and training of in-country programs and professionals.

We will comply with CBD legal framework and with host countries' legal framework on animal ownership.

d) *Strategy*: Liaise with CITES, OIE, CBD.

Action: WAZA through its ongoing program.

5. Objective: Develop recommendations to foster community involvement, both within range countries and zoo communities

Action: WAZA to refer to IZE/education committee.

Objective 5 is a matter of best practice, not organization. We recommend that environmental education and community involvement are integral parts of organizational planning both in range countries and *ex situ* efforts.

6. Objective: Promote and facilitate regional implementation of global plan

a) *Strategy*: Monitor and evaluate plan.

Action: CBSG to develop a process with coordinator.

b) *Strategy*: Develop plan for ongoing evaluation, follow-up, and evolution of strategy.

Action: CBSG to develop a process with coordinator.

The group discussed the issue of roles along the following lines. Final decisions of the group are captured in the above objectives, but it might be worthwhile to look through these discussion points when going forward with the action plan:

Determine roles of CBSG/WAZA/Governments

- WAZA leadership as a global umbrella organization that coordinates (databases of regional species projects; linking partners)
- level of engagements with governments to be discussed
- WAZA approach inclusive work with WAZA non-affiliated organizations
- coordination with ASG, sharing the agenda
- coordination with IUCN specialist groups (Sustainable Use, Reintroduction, etc.)
- explore appropriate opportunities for cooperation with commercial sector
- ethical engagement
- start small/determine incremental steps.

What CBSG-WAZA general roles and abilities are:

CBSG: Part of SSC; SSC sees CBSG as overseeing the Amphibian Survival Program by linking *in situ/ex situ* programs.

CBSG has in the longer term an over-all guidance and advisory role for SSC.

CBSG has a role as catalyst and facilitator, good at innovative solutions and tools.

CBSG has a history of giving away things; not the long-term implementer; is ready to step back when appropriate.

CBSG can react faster than governmental organizations; doesn't hesitate to act.

Fear that *ex situ* actions move faster than other components.

Examples: Coordinator position in CBSG moves away into other coordinating organisms.

Translate/coordinate this global effort in different regions/countries.

Submit resolutions to IUCN convention only by members (e.g. WAZA) not CBSG.

WAZA is the only global organization of zoos and aquariums.

WAZA has institutional membership, not individuals as CBSG: 218 Institutions, 22 associations >1000 in the network through associations, 11 affiliates (incl. DGHT),

WAZA is a member of IUCN (includes 30 institution voting rights)

WAZA funds several bodies of IUCN (CBSG, SSC Chair, others)

WAZA develops strategies often with CBSG, has a Code of Ethics

WAZA represent the zoo communities in international fora (CITES, CBD, CMS, etc.)

WAZA does international marketing and PR.

Precedents in working in international issues (e.g., CITES)

WAZA can be an advocate/coordinator/clearing house

WAZA works through/with its members

WAZA liaises with *in situ* organizations

Training grants of CIRCC

WAZA has the ability to put out the call to the world zoos and coordinate

Influences 600 million visitors worldwide. This constituency (membership/visitors) in order of magnitude is larger than any other conservation organization.

Communication power of WAZA's members beyond *ex situ* is larger than anything else.

Provide positive message (beyond extinction)

WAZA is an expert organization (more important than lobbying)

WAZA can act as communication conduit for ASG and ACAP and other conservation organizations.

WAZA's possible roles regarding amphibians:

Provide liaison to CITES and OIE

Promote individual projects by WAZA branding

Promote and create awareness in the wider amphibian context

Following internal procedures, WAZA may:

- Adopt and publish husbandry guidelines
- Establish global Amphibian TAG with CIRCC (training grants, international studbooks, interregional breeding programs, WAZA office provides secretariat or draw on regional TAGs, timeline end of August

ZIMS/ISIS, affiliate to WAZA, is a database system that can handle species information *ex situ* needs

We need an amphibian-program-focused database (beyond ZIMS)

WAZA can develop guidelines to be followed by universities/education institutions.

Roles and contributions of other organizations: Narrow focus here: other organizations interested in *ex situ* programs at the organizational level such as governments, universities, NGO's, commercial sector, pet trade, ranching and farming.

Explore appropriate engagement in ranching and farming interests (sustainable use).

Identify commercial breeders, a challenging area with low priority.

Museums and botanical gardens can be potential partners (licensing issues/regions)

Facilitate obtaining governmental approval of programs and permits: use CITES meeting in Lima.

Coordinate with WAZA affiliates and local government agencies.
IUCN channels recommendations to local governments (*ex situ* efforts)
Awareness in government agencies about conservation issues; give appropriate priority.
Engage national biodiversity agencies (where they exist) to adopt global plan for amphibian conservation.
Regional or national meetings should be held under umbrella of national Biodiversity Offices.
Universities, NGO's, other groups can be part of *ex situ* effort and database
Sanctioning issues/ethics/data-sharing (accreditation: how to deal with not complying with ethical codes: issue not resolved).

BEST PRACTICES WORKING GROUP

Group members

Beat Akeret, Paul Crump, Luis Coloma, Dante Fenolio, Samuel Furrer, Bob Johnson, Jessie Krebs, Karen Graham, Bob Mailloux, Gale Mailloux, Gerry Marantelli, Allan Pessier, Scott Pfaff, Mike Ready, Jean Rafaelli, Evgeny Ryboltovsky, Andy Snider, Mark Wanner, Kevin Zippel

Preamble

Standards are provided for the *ex situ* housing and maintenance of amphibians and recommendations made for fostering community involvement. These husbandry standards are designed to ensure the highest quality of care for captive amphibians, to minimize the transmission of disease between captive species, and to prevent the introduction of exotic pathogens into unexposed environments. They are intended to be general husbandry guidelines. Specific protocols will be determined by the individual species selection process.

Key result area: Best Practices For *ex situ* Facilities

1. Objective: Determine and expand capacity (holding and husbandry)

- a) *Strategy*: Establish target number for population management.
Action Steps: Receive recommendations from ASG (species specific) KZ
Locate researchers doing work in amphibian-specific heterozygosity maintenance/
gene diversity in captive populations. Couple them with funding opportunities
and recommend creation of a research liaison. KZ
Apply Vortex or similar modeling. Assistance from AZA Population Management
Center/AS to coordinate with RA Odum (Toledo Zoo).
- b) *Strategy*: Qualify existing holding capacity considering need for isolation.
Action Steps: If goal is release for restoration, increase isolation requirements.
(See document produced.)
For release animals, minimum quarantine guidelines: permanent quarantine
facility, single species or species assemblages per room, waterproof building,
all effluent treated with pressure heating, shower in/out or dedicated uniform
and shoes at minimum, HVAC air filtration to 10 micron.
Match participating institutions with funds to facilitate adequate isolation
facilities. Range-country holding facility recommendations: sterilize water for
exclusion of Target pathogen(s), incoming and effluent.
- c) *Strategy*: Quantify qualified holding capacity. Compare to species needs.
Action Steps: Capacity to keep animals outside range countries is zero.
Investigate and determine capacities within range countries, e.g., zoos, aquariums,
museums, universities and private sector. Create a space survey within each
global region with specific reference to isolation requirements for in-range
facilities.
- d) *Strategy*: Create recommendations for institutions expanding holding capacity.
Action Step: Reference Husbandry.
- e) *Strategy*: Construct *Best Practices Manual* from DC outline.
Action Steps: Coordinate with other ACAP divisions (Assessment, Research) to
Identify hotspots and areas of species concern. KZ

Identify partners: 1) with expertise for implementation; 2) with capacity to receive/support infrastructure, utilizing existing zoological organizations. Link with financial support. KZ

f) *Strategy*: Increase capacity in range countries as needed.

Action Steps: Determine sources of expertise and group regionally.

Facilitate construction of new facilities

Design/implement husbandry training programs globally (AZA, Jersey, DGHT, French Urodela Group, etc.) AS/GM

Differentiate formal and informal training programs. Karen Graham

Communication among course administration (AZA/Jersey). Cross reference ACAP *Best Practices*.

Develop internship programs. (Jersey, re Gerardo Garcia?)

Determine global/regional need and capacity to host and advertise available programs.

Facilitate cascading training opportunities.

g) *Strategy*: Determine potential role of private sector.

Action Steps: Validation and recognition of the expertise of the private sector. Dante Fenolio, Mike Ready, KZ.

Consult attorney. Develop legally binding memorandum of understanding.

Evaluate existing MOUs. WAZA

Create statement to encourage collaboration of participating institutions and the private sector. Charge CBSG/WAZA with promotion of the statement to institutions. Use regional herp societies to facilitate a working relationship with the private sector.

Survey for regional interest and MOU enforcement issues, recognizing that private-sector issues relate mostly to North America, Europe and Japan.

Form a joint committee, zoo/private/others, to evaluate and modify the TSA model to all parties for approval. (Examples: Private sector: IAD, DGHT, TreeWalkers, Intl., Japanese private sector. Zoos: Erik Anderson, Erik Keyster, NAIB, French Urodele Group.)

Consider financial assistance/matching funds for private sector assistance/support. Mike Ready, Dante Fenolio.

h) *Strategy*: Determine potential role of academia.

Action Step: Work with ACAP Research Division; solicit through herp societies. Dante Fenolio?

i) *Strategy*: Determine potential role of cryogenics.

Action Step: Solicit recommendations from ART experts in zoo community. AS to check with Andy Kouba in Memphis

2. Objective: Set standards for husbandry and facility design

a) *Strategy*: Construct *Best Practices Manual* from DC outline.

Action Steps: Form veterinary/pathologist working group to write medical protocols to include procedures for health screening, prophylactic treatment for important infectious diseases (e.g. chytridiomycosis), and for disease surveillance (PCR testing; necropsy protocols). Allan Pessier, Kevin Wright, Brad Wilson

Compile database of husbandry manuals, TMAs, etc. Andy Snider.

Compile common knowledge basic husbandry documents. Scott Pfaff
Write recommendations for safe transport. Dante, Andy, Gerry
Establish lines of communication between *in situ/ex situ* experts for each species.
Kevin Zippel

- b) *Strategy*: Develop guidelines for population management. Andy Snider
Action Steps: Guidelines on founder numbers and collection schemes. AZA
Population
Management Center assistance
Guidelines on record-keeping and data sharing. Mark Wanner
Guidelines on breeding strategies. Dante, Mike, Gerry

3. Objective: Rescue animals

- a) *Strategy*: Develop recovery plans for each species selected for *ex situ* action.
Coordinate with rapid response team.
Action Step: After receiving recommendations from GAA and/or AGA, develop and
Implement appropriate recovery plans. KZ and Joe Mendelson
- b) *Strategy*: Match institutions to species/regions, determined upon species selection
process. Coordinate with that group.
Action Step:
- c) *Strategy*: Establish collection teams. See above.
Action Step:
- d) *Strategy*: Establish how to handle confiscations. Joe Mendelson
Action Step:

4. Objective: Develop recommendations to foster community involvement, both within range-country communities and outside at external host zoo community

- a) *Strategy*: Evaluate and expand successful case studies.
Action Steps: Compile set of reference documents and resources derived from other
case studies, e.g., Project Golden Frog, PRCT. AZA Conservation/Education
Committee assistance.
Promote local awareness in host countries: frog calls, frog metamorphosis
programs, sister school relationships. KZ
Develop PPT presentation and other PR materials and website to increase
awareness, disseminate in schools. GM resource to assist.
- b) *Strategy*: Develop range of recommendations from graphics to leading new initiatives.
Action Step: Seek involvement of regional zoological associations and herp societies to
develop and deliver information, via websites, PPT, etc.

BEST PRACTICES WORKING GROUP

Quarantine Subgroup

Group members:

Allan Pessier, Dante Fenolio, Karen Graham

Preamble

Extended discussion in the entire Best Practices Working Group involved standards for quarantine and long-term disease risk management, especially in regard to captive animals destined for reintroduction into the wild. Chytridiomycosis is an example of a devastating infectious disease involved in amphibian population declines thought to have been disseminated worldwide by international animal movements. The outlined quarantine standards, although rigorous, seek to minimize the risk of introducing additional disease threats to imperiled amphibian populations. The risk of introduction of important infectious diseases to novel locations increases when animals from a variety of distinct geographic regions are housed in very close proximity such as in the cosmopolitan animal collections typical of most zoological institutions. The group had concerns that incorporating stringent criteria may prohibit important zoological institutions from participating in ex-situ conservation efforts involving releases to the wild; however, it was felt that high quarantine standards must be established to decrease the spread of amphibian pathogens. While we acknowledge that flexibility in guidelines will be necessary, certain standards are essential. In all circumstances “preferred standard” is the safest and recommended scenario. If the preferred standard is not used, participating institutions must adhere to the strictest of standards for the options we have provided.

We define “amphibian quarantine facility” (AQF) as a permanent quarantine facility eliminating exposure of range country animals to cosmopolitan zoo collections of animals from broad geographic origins. Animal destined for release to the wild never leave the AQF, except for return to the range country.

Carbon filters are being applied in two of our procedures to reduce the risk of exposure of valuable and sensitive amphibians to possible chemical contaminants (e.g. pesticides, water treatment chemicals, and heavy metals).

Quarantine 1: Standards for out-of-range permanent quarantine facilities with intent to return to the wild in range country

The primary concern for this level of quarantine is preventing acquisition of an infectious disease by animals destined to be released into the wild. Additional concerns include transmission of disease between distinct species or species assemblages within the AQF and disease transmission from species in the AQF to collection animals or native amphibians.

Preferred standard for location of the AQF: Quarantine facility is a completely separate building from the cosmopolitan animal collection. Only a single species or species assemblage (an amphibian faunal group that naturally occurs in the range country) is permitted per room. Facilities that house individual species or species assemblages in self-contained units (such as modified shipping containers) may have advantages over a dedicated building.

Minimum standard for location of AQF: Dedicated space in a cosmopolitan animal facility must consist of isolated rooms, containing only a single species or species assemblages as described for the preferred standard (above). Animals need to be taken care of *first* in the day before servicing of animals in the cosmopolitan collection. It is important for managers to understand that this constitutes the AQF and “shower-out” or minimum equivalent must occur *prior* to handling non-quarantine collection animals (see standards for working between species and species assemblages below).

Preferred standard for working between species and species assemblages: Dedicated clothing and footwear should be available for each species and changed before working with a different species or species assemblage. Disposable protective clothing (e.g. Tyvek suits) may be useful in this regard. Ideally, keepers would have appropriate facilities to shower between servicing each species or species assemblage housed in the AQF (“shower out”). Gloves must be worn while accessing amphibian enclosures. Depending on pathogen risk, dedicated glove use may be required per individual container, per species, or per faunal group.

Minimum standard for working between species and species assemblages: Dedicated clothing and footwear should be available for each species and changed before working with a different species or species assemblage. Disposable protective clothing (e.g. Tyvek suits) may be useful in this regard. Gloves must be worn while accessing amphibian enclosures. Depending on pathogen risk, dedicated glove use may be required per individual container, per species, or per faunal group.

Guidelines for disposal of water and wastes: Facility wastewater must be treated to minimize risk of introduction of foreign pathogens out of facility and into surrounding area. Heat and pressure wastewater treatment is strongly preferred. At minimum, chlorine treatment of wastewater must take place in an amphibian-safe manner (e.g., consider chemical fumes from sterilization agents).

Solid waste disposal, including all substrate, props, gloves, etc., should be decontaminated by way of incineration, disposal by medical waste hauler or heating to a minimum of 160°F for 20 minutes and discarded.

For carcass disposal, institutions must follow appropriate necropsy procedures. Accepted final tissue disposal options include: incineration, alkaline tissue digestion, formalin or alcohol fixation, or disposal by certified medical waste hauler; thus, complete uniform change, inclusive of footwear, is necessary.

Room security is high priority: Entrance or access to rooms in the AQF by native wildlife, vermin, or in shared-facility scenarios, escaped collection amphibians, can result in pathogen transfer.

Cockroaches and other vermin are known to infiltrate amphibian enclosures and can be a source of disease transport. Take into consideration their movement through plumbing, preference for damp environments, and ease of movement through narrow spaces (particularly in the juvenile

stage). Ventilation systems need to be outfitted with filters to stem the influx of pest insects that could become cage to cage pathogen carriers.

Preferred standard for room security: Rooms are vermin-proof especially for cockroaches.

Quarantine 2: Standards for in-range country facilities with intent to return to the wild

The primary concerns with these facilities include the entrance of a pathogen but not necessarily the exit (i.e., where significant pathogens may already exist). However, under some circumstances, such as incorporating related species from isolated geographic ranges within the range country (e.g., two river valleys separated by a high altitude ridge), stricter criteria may be necessary. These decisions should be deferred to regional experts in country.

Colonies should not come into contact with any other captive-maintained amphibians (cosmopolitan animal facilities as described above). In the event that it is necessary to incorporate animals into in-country institutions that maintain other animals, the **Quarantine 1** level of standards must be applied

Animals brought into these facilities should be treated for known disease problems of concern (such as chytridiomycosis). It may not be necessary to cover all possible pathogens such as some intestinal parasites or commensal fauna/flora.

Where known disease conditions exist in the wild, water entering the facility must be obtained from a disease free source **OR** treated to safeguard inhabitants. Heat pressure treatment is the preferred standard. Options include sediment prefilters capable of eliminating small-sized pathogens or chemical disinfection (e.g. chlorine bleach) There are serious concerns about accidental and catastrophic exposure of resident amphibians to chemicals as well as environmental implications of chemical treatment.

To prevent reinfection with pathogens of concern, it is important that native amphibians cannot get into the facility and preferable that the facility be as secure as possible.

Field clothing should not be worn in the amphibian facility and dedicated clothing is the preferred standard.

Quarantine 3: *Ex situ* out-of-range for display, research, education, with no possibility of return to the wild in range country

Animals are processed through normal health screening procedures. Treatment for known disease risks (e.g., chytridiomycosis) apply. For disposal requirements for bedding, carcasses, etc., standards set above for highest quarantine level apply.

BEST PRACTICES WORKING GROUP

Housing Subgroup

Members

Beat Akeret, Luis Coloma, Paul Crump, Samuel Furrer, Jessie Krebs, Bob Mailloux, Gale Mailloux, Gerry Marantelli, Scott Pfaff, Mike Ready, Jean Rafaelli, Evgeny Ryboltovsky, Andy Snider, Mark Wanner

Preamble

There is a significant need to provide in-range and out-of range housing and breeding facilities for endangered amphibians. The information presented below was assembled by a global consortium of amphibian specialists to guide participating institutions in their efforts to preserve amphibians.

The purpose of this document is to provide standards for the housing and maintenance of *ex situ* amphibians and to make recommendations for fostering community involvement. These husbandry standards are designed to ensure the highest quality of care for captive amphibians, to minimize the transmission of disease between captive species, and to prevent the introduction of exotic pathogens into unexposed environments. These are intended to be general husbandry guidelines. Specific protocols will be determined by the individual species selection process.

Husbandry 1: Severe = Ark, Rescue or Supplementation Minimum husbandry standards for amphibians or progeny expected to be ultimately returned to the wild.

See Husbandry 2 Lowest standards below, also include:

- a) maximize use of automation in water quality maintenance
- b) one species or local assemblage per room/unit
- c) maintain consistent/directional flow of routine during maintenance and feeding
- d) food must come from secure standards; three-month familiarization with natural food types prior to release
- e) design of enclosure should minimize keeper/animal contact
- f) climate conditions (lighting, photoperiod, temperature, rainfall, humidity, etc.) should vary and follow a standard for the species; three-month familiarization with “natural” conditions prior to release
- g) during familiarization, monitor condition of specimens to determine fitness for release
- h) highest level of record-keeping, as needed.

Husbandry 2: Intermediate = Conservation or Research Minimum husbandry standards for amphibians maintained in captivity for conservation or research purposes with *no* prospect of return to the wild.

See Husbandry 3 Lowest standards below, also include:

- a) maximize use of automation in water quality maintenance
- b) maintain consistent/directional flow of routine during maintenance and feeding
- c) design of enclosure should minimize keeper/animal contact

- d) climate conditions (lighting, photoperiod, temperature, rainfall, humidity, etc.) should vary and follow standard for the species
- e) highest level of record-keeping, as needed.

Husbandry 3: Lowest = Education or Farming Minimum husbandry standards for amphibians maintained in captivity *not* required for conservation or expected for release.

- a) escape-proof housing and size appropriate for species
- b) scheduled water changes – automated or manual
- c) water-free pathogens or other chemistry at risk to the species
- d) exposure to natural light, if exposure is common in natural history of species (artificial or natural)
- e) appropriate temperature for natural history of species (mean temperature)
- f) appropriate cage furnishings, wherever necessary
- g) appropriate food, dependent of species – supplementation (vitamin/mineral).

Husbandry and quarantine level determination: matrix design

Husbandry 1 <u>Ark/Rescue/Supplementation</u>	Husbandry 2 <u>Conservation/Research</u>	Husbandry 3 <u>Education/Farming</u>
<ul style="list-style-type: none"> A. In Range B. Nearby C. Far Away 	<ul style="list-style-type: none"> A. In Range B. Nearby C. Far Away 	<ul style="list-style-type: none"> A. In Range B. Nearby C. Far Away
<ul style="list-style-type: none"> a. Disease Risk b. Non-disease Risk 	<ul style="list-style-type: none"> a. Disease Risk b. Non-disease Risk 	<ul style="list-style-type: none"> a. Disease Risk b. Non-disease Risk

Quarantine level determination for the three Husbandry standards:

Husbandry 1 = Ark/Rescue/Supplementation Any amphibian or progeny expected to be ultimately returned to the wild.

- In Range: Quarantine 2 standards apply
- Nearby Range: Quarantine 2 standards apply
- Far Away: Quarantine 1 standards apply.
- Disease risk and non-disease risk categories are not needed. All Range situations should be treated the same.

Husbandry 2 = Conservation and/or Research Any amphibian or progeny maintained in captivity for conservation or research purposes with *no* prospect of return to the wild.

- In Range, Disease Risk: Quarantine 2 standards apply
- In Range, Non-disease Risk: Quarantine 3 standards apply
- Nearby Range, Disease Risk: Quarantine 2 standards apply
- Nearby Range, Non-disease Risk: Quarantine 3 standards apply.

Far Away, Disease Risk: Quarantine 1 standards apply
Far Away, Non-disease Risk: Quarantine 1 standards apply.

Husbandry 3 = Education and/or Farming Any amphibian or progeny maintained in captivity *not* required for conservation or release.

In Range, Disease Risk: Quarantine 2 standards apply
In Range, Non-disease Risk: Quarantine 3 standards apply
Nearby Range, Disease Risk: Quarantine 2 standards apply
Nearby Range, Non-disease Risk: Quarantine 3 standards apply
Far Away, Disease Risk: Quarantine 1 standards apply
Far Away, Non-disease Risk: Quarantine 1 standards apply.

Definition of Ranges

In Range = *in situ* captive programs
Nearby Range – close to *in situ* range, i.e., El Valle Project
Far Away = out-of-country or continent. Cross of environmental barrier, i.e., water, land

Housing

Maximize automation to minimize hands-on
Amphibian-safe enclosure fabrication
Some plastics, fiberglass, adhesives, etc., may be unsafe: depends on components.

Water Quality

Species specific: consider natural history
Pool of consultants will make best recommendations and add species accounts as needed
Continuous flow-through or well-filtered preferred over dump-and-fill or large water changes (minimize chemical flux)
Ammonia parameters, etc., species-specific sensitivities.

Nutrition: to be deferred to Kevin Wright and Allan Pessier

Vitamin A deficiency as an emerging nutritional disease
Availability of small insects
Diversity of insects, of various sizes
C: P supplementation
Cold-climate species challenges
Non-natural insect diets, pathology concerns, supplements: recommendations needed.

Veterinary care: deferred to Kevin Wright and Allan Pessier

Necropsy requirements
Histopathology/disease diagnosis
Amphibian-specific necropsy protocols
Health screening on entry to facility
Treatment on entry into facility

Safe Transport

Shipping guidelines—weather safety, turbulence issues with tadpoles, especially non-stream species—increase water volume and cool

X reference with IATA regulations

Holes punched in shipping containers from the inside out, duct tape containers to bottom of internal box

Egg shipping can be easy, e.g., terrestrial eggs: moss cup, capped with more moss, narrow-necked bottle mostly water-filled and upright for aquatics. (Can't use moss if shipping international!)

SPECIES SELECTION WORKING GROUP

Group members

Andrés Acosta, Kevin Buley, Verónica Cano, Jorge Garcia, Richard Gibson, Graeme Gillespie, Bob Johnson, Bob Lacy, Saskia Lafebre, Francisco J. López- López, César Molina, José Vicente Rodríguez-Mahecha, Tim Skelton

Preamble

DECISION TREE FOR SELECTION AND PRIORITIZATION OF TAXA FOR *EX SITU* CONSERVATION

Rationale

Ex situ conservation and management of a threatened amphibian species should only be considered as an alternative when the absolute imperative of *in situ* amphibian conservation cannot by itself ensure the survival of a species and its ecosystem.

An *ex situ* initiative should be viewed as just one of the tools that can help in the over-all conservation of a species. It therefore follows that strong links between *ex situ* and *in situ* components are fundamental to the long-term success of species conservation. Full integration between *in situ* and *ex situ* conservation approaches should be sought wherever possible. This is normally best highlighted through the establishment of a formal Species Action Plan/Species Recovery Plan that explicitly states the short-, medium- and long-term goals of each component of the conservation initiative.

When *ex situ* management of an amphibian species is considered necessary and appropriate, the priority should be to establish the initiative within the range state of ecological origin. Emphasis should therefore be placed on developing appropriate capacity within the range state where this does not exist.

Data derived from *ex situ* management of amphibians should be made openly available to workers involved in the *in situ* conservation of the species (or similar species) and *vice versa*.

In exceptional cases where an *ex situ* conservation initiative has been established prior to/in the absence of a concurrent *in situ* initiative (e.g., where a political situation prohibits it, where a disease problem invalidates it, etc.), emphasis should be placed on establishing the appropriate *in situ* links as soon as it becomes possible to do so.

The persistence of a species over the long-term is only assured by its conservation *in situ*. Therefore, an *ex situ* component to a conservation program should only ever be viewed as a short- or medium-term initiative, and its conservation aim should always be to render its own requirement superfluous!

This Decision Tree has been structured in three ‘phases.’ Phase One of the Decision Tree ensures there is justification for an *ex situ* program. It consists of three fundamental questions with “yes”

or “no” answers. These questions should be applied to the taxon under consideration, answering each honestly and objectively.

Phase Two of the Decision Tree takes those species that have ‘passed’ Phase One and attempts to prioritize them: i.e., with limited resources (space, staff, money, etc.), which species should have *ex situ* programs established ahead of others? It takes the form of a series of questions with weighted scores. The total score for a species indicates how ‘important’ an *ex situ* program for the species is in relation to others. Some questions may not be straightforward to answer and will require consultation with colleagues, taxonomic experts and other individuals/groups working with the species.

Phase Three of the Decision Tree considers the practical feasibility of initiating and maintaining an *ex situ* program once justified and considered a priority.

PHASE ONE: Initial Taxon Selection

Phase One of the Decision Tree is designed specifically to establish whether or not the justification exists to consider an *ex situ* program. Phase One does not consider issues of prioritization between taxa. It provides only a ‘first cut’ using yes or no answers. Only if a species makes it through Phase One, by answering ‘yes’ to all three questions, should it be considered for an *ex situ* initiative. It should then be passed through Phase Two to determine the relative importance of the proposed program in relation to other species.

a) General Justification

1. Conservation role: Does the proposed *ex situ* initiative have a clearly defined role (see Appendix 2) in the conservation of the target taxon or its habitat?
Yes: Go to 2
No: Insufficient justification for an *ex situ* conservation component at this time. DO NOT CONTINUE.
2. Mandate: Is there an existing mandate (see Appendix 1) recommending the *ex situ* conservation of this taxon?
Yes: Go to 3.
No: Insufficient justification for an *ex situ* conservation component at this time. DO NOT CONTINUE OR SEEK MANDATE FROM ASG OR OTHER AUTHORITY.
3. Range State approval: Does the proposed *ex situ* initiative have the current support of the range state (either within the range state or out-of-country *ex situ*)?
Yes: Go to 4 (Phase Two, Section B)
No: Insufficient justification for an *ex situ* conservation component at this time. DO NOT CONTINUE OR SEEK APPROVAL FROM RANGE COUNTRY (WITH HELP FROM ASG AS REQUIRED).

PHASE TWO: Prioritization of Selected Taxa

Phase Two of the Decision Tree takes those taxa that have been selected for *possible ex situ* initiatives from Phase One and attempts to prioritize them. The questions should again be worked through sequentially, answered as objectively as possible and scores assigned. After all

questions have been asked, a total score should be calculated to give a total species priority score.

b) Program Considerations

4. Threat mitigation: How potentially reversible are the threats currently facing the taxa in the short- to medium-term?

Prospect that threats can be reversed within 1-5yrs	Score 20
Prospect that threats can be reversed within 5-10yrs	Score 12
Threats may be reversible in unknown time frame	Score 4
No prospect of threat reversal	Score 0
Threats unknown*	Score 0

*Convey research need to ASG

5. Primary Conservation role: What is the primary conservation role of the target taxon? (as defined in Q.1/Appendix 2) N.B. Taxon may have more than one role, but only score the primary role:

Ark	Score 20
Rescue/Supplementation	Score 14
Conservation Research:	Score 10
Farming:	Score 6
Conservation Education:	Score 0

c) Taxon Considerations

6. Extinction risk: What is the current IUCN Red List category for the taxon?

Critically endangered	Score 20
Endangered	Score 16
Vulnerable	Score 12
Data deficient*	Score 8
Near threatened	Score 4
Least concern	Score 0

*Taxon has been regionally or nationally recognized as 'at risk' despite data deficiency.

7. Phylogenetic uniqueness: e.g., is it a monotypic taxon?

Monotypic family	Score 10
Monotypic genus	Score 7
Species	Score 3
Sub-species	Score 0

8. Biological distinctiveness: e.g., does it exhibit a unique reproductive mode, unique physiology, etc., among the Class Amphibia?

Aspect of biology unique to species	Score 10
Aspect of biology shared with <6 other species	Score 5
No aspect of biology known to be exceptional	Score 0

9. Ecological significance: Does the taxon provide important ecosystem services?

Keystone species	Score 10
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Principal component of ecosystem process	Score 7
Major component of ecosystem process	Score 3
Unknown	Score 0

10. Cultural importance: Does the taxon have a special human value within its natural range or in a wider global context? E.g... as a national or regional symbol, in an historic context, as an 'iconic' amphibian species, etc.

Yes	Score 10
No	Score 0

11. Socio-economic importance: Does the taxon have an economic value within its natural range (e.g., food, traditional medicinal, tourism) or have the capacity to function as an 'umbrella' species?

Yes	Score 10
No	Score 0

12. Scientific importance: Is current or planned research, unrelated to the taxon's biology and taxonomy, dependent upon the taxon? E.g., human medical, conservation-related studies, etc.

Research dependent upon species	Score 10
Research dependant upon <6 species (incl. this taxon)	Score 5
Research not dependant upon species	Score 0

PHASE TWO SCORE = X/100. HIGHER SCORE INDICATES HIGHER PRIORITY

PHASE THREE: Feasibility of *ex situ* Program

Phase Three of the Decision Tree looks at the feasibility of undertaking an *ex situ* program for justified, prioritized species. It also functions as a form of evaluation/planning with respect to readiness to implement a program.

d) Population Establishment

13. Founder specimens: Are sufficient animals of the taxon available or potentially available (from wild or captive sources) to initiate the specified *ex situ* program?

Yes: Go to 14 (Section e)

No: Insufficient potential founder specimens to initiate the *ex situ* program.

DO NOT CONTINUE - EVALUATE OPTIONS FOR ALTERNATIVE CONSERVATION STRATEGY INCLUDING GAMETE CRYOPRESERVATION.

e) Program Stability

14. Financial security: Is there sufficient financial support for the anticipated life of the *ex situ* initiative? Or is there good reason to believe that further financial support is realistically achievable?

Yes: Go to 15

No: Inadequate resources. DO NOT CONTINUE – EXPLORE POSSIBILITIES FOR FINANCIAL SUPPORT WITH HELP FROM ASG AS APPROPRIATE.

15. Organizational and political security: Is the stability of the institution/region/state, etc., sufficient to ensure a continued commitment to the *ex situ* program over its anticipated lifespan?

Yes: Go to 16 (SECTION F)

No: Insufficient stability. DO NOT CONTINUE.

f) Taxon Knowledge

16. Background *ex situ* species knowledge: Is there a history of keeping and breeding this taxon successfully in captivity?

Yes: Go to 19 (SECTION G)

No: Go to 17

17. Background *in situ* species knowledge: Is there sufficient understanding of the ecology, behavior and reproductive mode of the taxon to infer the likely *ex situ* requirements?

Yes: Go to 19 (SECTION G)

No: Go to 18

18. Analogous species: Despite a lack of direct knowledge of the *ex situ* requirements of the target taxon, can they be inferred with a reasonable degree of confidence from similar/related taxa?

Yes: Go to 19 (Section G)

No: Insufficient knowledge of the taxon and its requirements at this time to allocate *ex situ* resources. DO NOT CONTINUE.

g) Accommodation

19. Current facilities: Are the appropriate quality and quantity of facilities (in country or out of country) currently available? Not just for founder animals, but also for captive-bred offspring of all life-stages/sizes? (Consider space, heating, cooling, water supply, water quality, water disposal, lighting, substrate, ventilation, etc.)

Yes: Go to 21 (Section H)

No: Go to 20

20. Planned facilities: Are there clear plans, within a specified timeframe, to develop the appropriate quality and quantity of facilities to permit the full development of the planned *ex situ* program (in-country or out-of-country)?

Yes: Go to 21 (Section H)

No: Insufficient infrastructure available or planned to permit the likely successful development of the *ex situ* program for this taxon.

DO NOT CONTINUE. CONTACT ASG WITH RESPECT TO POSSIBLE IMPLEMENTATION OF RAPID RESPONSE WHERE URGENT ACTION IS NECESSARY.

h) Husbandry and Management

21. Staff: Are adequate numbers of skilled staff available with the appropriate *ex situ* amphibian experience? Or can they be trained?

Yes: Go to 22

No: Inadequate personnel to conduct program. DO NOT CONTINUE. CONTACT ASG WITH RESPECT TO POSSIBLE IMPLEMENTATION OF RAPID RESPONSE WHERE URGENT ACTION IS NECESSARY.

22. Food supply: Is there a guaranteed food supply, both in quality and quantity, for adult, immature and larval stages of the taxon?

Yes: Go to 23

No: Inadequate resources. DO NOT CONTINUE. EXPLORE FOOD SUPPLY OPPORTUNITIES.

23. Management: Is the appropriate standard of record-keeping and knowledge of small population management available to help minimize the risk of potential deleterious effects such as loss of genetic diversity, artificial selection, pathogen transfer, hybridization, etc.? (This expertise does not necessarily have to be held at the facility itself, but access to these skills is essential).

Yes: Go to 24

No: Inadequate skills to support the *ex situ* program. DO NOT CONTINUE.

24. Veterinary care and health screening: Has provision been made for the routine health monitoring of the population and is the appropriate level of veterinary care available?

Yes: Go to 25 (Section I)

No: Inadequate resources. DO NOT CONTINUE. SEEK VETERINARY SUPPORT.

i) Quarantine and Biosecurity

25. Species isolation: Are appropriate measures in place at the proposed *ex situ* facility to minimize the risk of possible disease transfer to or from other *ex situ* amphibian populations?

Yes: Go to 26

No: Insufficient measures currently in place to prevent disease transfer. DO NOT CONTINUE. REVIEW AND IMPROVE BIOSECURITY.

26. Escapes: Are measures in place to minimize the risk of animal escapes and introduction of an invasive species?

Yes: Go to 27

No: Animal security measures not sufficient. DO NOT CONTINUE. REVIEW AND IMPROVE BIOSECURITY.

27. Water treatment: Are the appropriate waste water treatment regimes in place to eliminate the possibility of disease transfer from the *ex situ* population to the external environment?

Yes: *Ex situ conservation initiative is feasible.*

No: Bio-security measures inadequate. DO NOT CONTINUE. REVIEW AND IMPROVE BIOSECURITY.

Species Selection: APPENDIX One

Mandate for *ex situ* Conservation

The recommendation for an *ex situ* population of a threatened amphibian species can come from a number of recognized sources such as:

- The Global Amphibian Assessment (www.globalamphibians.org). A list of all species recommended for *ex situ* conservation action in the GAA, 240 in total.
- The IUCN Red List (The IUCN Technical Guidelines for the Management of *ex situ* Populations recommend *ex situ* populations for all critically endangered species.)
- An IUCN/SSC Conservation Breeding Specialist Group (CBSG) Population and Habitat Viability Assessment (PHVA) workshop process (www.cbsg.org/toolkit/phvas.scd)
- An IUCN/SSC Conservation Breeding Specialist Group (CBSG) Conservation Assessment and Management Plan (CAMP) process (<http://www.cbsg.org/toolkit/camps.scd>)
- An IUCN/SSC Global Amphibian Specialist Group (GASG) recommendation
- An IUCN/SSC regional reptile and amphibian specialist group recommendation (Madagascar & Mascarene, Europe or China)
- A published Species Action Plan
- A local, regional or national government request.

Species Selection: APPENDIX Two

Defined Conservation Role

Simply keeping and breeding threatened amphibian species in captivity does not in itself equate to conservation. As part of a genuine amphibian conservation initiative, the *ex situ* captive management should not only form part of the recommended conservation action for the species, but must also have a clearly defined role in the conservation of the species or its habitat.

The *ex situ* Conservation Advisory Group of the DAPTF considers the following to be clearly definable conservation roles for the *ex situ* management of amphibian species:

- a) *Ark*: An amphibian species that is extinct in the wild (locally or globally) and which would become completely extinct without *ex situ* management.
- b) *Rescue*: An amphibian species that is in imminent danger of extinction (locally or globally) and requires *ex situ* management as part of the recommended conservation action.
- c) *Supplementation*: An amphibian species for which *ex situ* management benefits the wild population through breeding for supplementation as part of the recommended conservation action.
- d) *Farming*: An amphibian species threatened through wild collection (e.g., as a food resource), which is being bred in captivity – normally in-country, *ex situ* -- to replace a demand for wild harvested specimens. This category generally excludes the captive-breeding of pet and hobbyist species, except in exceptional circumstances where

coordinated, managed breeding programs can demonstrably reduce wild collection of a threatened species.

- e) *Conservation Research*: An amphibian species undergoing specific applied research that directly contributes to the conservation of that species, or a related species, in the wild. This would include clearly defined 'model' or 'surrogate' species.
- f) *Conservation Education*: An amphibian species that is specifically selected for management, primarily in zoos and aquariums, to inspire and increase knowledge in visitors, in order to promote positive behavioral change: for example, when a species is used to raise financial or other support for field conservation projects. (This would include clearly defined 'flagship' or 'ambassador' species.)

RAPID RESPONSE WORKING GROUP

Group members

Ana Lucrecia Arosemena, Jorge Garcia, Edgardo Griffith, Vanessa Kilburn, Joe Mendelson, Melquiades Ramos, Stephen van der Spuy

Preamble

The *ex situ* Program of the IUCN Amphibian Conservation Action Plan (ACAP) issued a directive to establish a response program to rapidly implement capacity in range countries in response to amphibian crises. Under umbrella approval of IUCN and range-country governments, response programs deliver basic protocol and capacity to countries facing amphibian crises. These protocols must be flexible in nature to respond to crises deriving from causes as disparate as disease, habitat loss, contamination, climate change, etc. This will require identification of secure funding and dedicated staff to devise and implement the response program defined below.

The purpose of these programs is to establish basic *ex situ* amphibian operations during the suggested time required while permanent capacity for *ex situ* operations is developed in the range country. This purpose directly addresses the common problem of delays in conservation action that result from insufficient capacity in range countries, and ties directly to commitments to build permanent capacity in those countries. Key elements of these programs will include identifying and training of national citizens and agencies in all aspects of *ex situ* programs, for example: husbandry, veterinary, management, fund raising, and public education. Successful implementation of programs will require fluid communication at all levels between IUCN-ASG, national governments, and local citizens in affected areas.

Key result area: Capacity for Rapid Response

1. Objective: Define Response Program (RP)

“An operative protocol available to range countries and other stakeholders, in order to quickly deliver capacity to create an *ex situ* amphibian conservation program.”

2. Objective: Establish administration and operations

a) *Strategy*: Secure funding for program.

Action Step: Establish RP as a prioritized program in ASG funding structure. (Joe Mendelson, 2006)

b) *Strategy*: Identify staff to manage RP. ASG.

Action Steps: Identify basic administrative positions, e.g., Project Managers (in-country and at main administration), Inter-group Liaison Coordinator, Accountant.

Devise field-teams comprising a small international group of logistical experts:

Team Leader

Field biologists/ecologists

Veterinary technician

Technical Staff: laboratory & infrastructure

Develop a list of basic portable resources necessary for implementing basic *ex situ* capacity.

Develop available stockpile of basic resources.

- c) *Strategy*: Establish baseline diplomatic relations between IUCN and national governments, to enable possible implementation of RP in all possible countries.

Action Step: Achieve IUCN support for RP.

- d) *Strategy*: Create formal links between RP administration and other groups (e.g., Species Selection; ACAP research-disease-habitat groups, range countries), to receive recommendation to act.

Action Step: Establish formal links to include RP in other action plans (e.g., ASG, other IUCN initiatives, WAZA, governmental wildlife programs).

3. Objective: Define stepwise operational protocol

- a) *Strategy*: Identify species at risk and scope of operations requested by national government.

Action Steps: Refer to ASG species-prioritization list, if one exists.

RP team to assess local situation, gather data, and react accordingly.

- b) *Strategy*: Establish cooperative plan with national and local capacity.

Action Steps: Identify and contact national agencies and institutions (e.g., NGOs, zoos, universities).

Identify and hire and train local staff.

Initiate program of education regarding scope and purposes of project.

Initiate program of national fund-raising to support long-term operations.

- c) *Strategy*: Determine scope and time-scale of operation to be conducted.

Action Steps: Confirm commitment of funds and resources necessary for project.

Identify and solve local challenges: access to sites, logistics, infrastructure, facilities, etc.

Begin animal collections, triage, basic diagnostic tests

- d) *Strategy*: Identify end of RP action.

Action steps: Prepare final report to local, national, and administrative entities.

Participate in transfer of all responsibilities related program to national capacity as it is developed.

CBSG/WAZA
AMPHIBIAN EX SITU CONSERVATION
PLANNING WORKSHOP

Final Report



Section 3
Working Group Notes

WORKING GROUP NOTES

ORGANIZATION NOTES – no notes provided

BEST PRACTICES NOTES

Objective overview

Andy Snider: On the rescue animal strategy, how do we create an action plan when we don't know the species?

AZ: Our objective would be to create AP of "What is next step if we did know species?"

Objectives

Determine and expand capacity, target numbers. 500 offered as a generic number from DC meetings.

Gerry Marantelli: This isn't realistic with wide variation in species natural histories. Need to create criteria for evaluation for each species

Dante F: 500 based mainly on bird/mammal models Gibbons system that may work for us. Lends to a relative bottleneck w/a few good years of recruits, but many years of dry years, so concurs that we need species based criteria.

Scott Pfaff: Should we first decide what percent of H should be saved and then try to maintain goal?

AS: For 20 years or shorter don't need the same numbers that AZA usually uses for models. Life span variance also alters genetic model.

Beat: We have to think for 10k years and need to maintain diversity that will support their needs.

GM: We should only consider those animals we can get back in the wild quickly.

KG: Do we need further research into H/P for specialist animals for better modeling? Nei pegged his amphibian species as high in these parameters. If 500 is based on mammal/bird models, can we do better?

Population size needs may be highly variable

GM: Cryo-preservation of sperm should be considered. We may have capacity for huge numbers through nontraditional means

Mark: Dr. Coloma already doing this and can hopefully add to the group discussion when he returns

GM, KZ, DF (summarized): Doesn't get met with hostility when it is an existing tool. It gets met as such when it is just storing tissue away indefinitely. The arguments come from lack of knowledge. Using as a tool for maintaining diversity for a couple decades while we are getting

husbandry, as long as it is an integrated response and not seen as a quick answer that alleviates all worry.

Jean: Remember that cryo-preservation only works (with current technology) for external fertilization which excludes many salamanders.

KG: Does this give priority to internally breeding species getting space in captivity, all other things being equal?

Bob: I think re catastrophic event possibilities, need more than one institution housing specimens.

Action: Recommend that more research done on gene diversity

Dante: Genetics from cryopreserved tissues can potentially serve reproductive needs in future.

Action: Need recommendations from geneticist.

Multiple levels of participation will be involved, from showcasing a couple specimens to major breeding programs.

Universities in the states may not be big players based on disposition regulations, but universities in other countries (i.e. countries of origin) may be big players.

Rescue animals

GM: Seem to be minor considerations relative to other issues we'll discuss

KZ: Concur, but we'll still spend a portion of time on this.

GM/KZ: Best place to save species is in country of origin, for that working group. Should we only concentrate on species where this is possible?

Add Strategies

- Place cryopreservation role under Determine and Expand Capacity and Develop Set Standards for Husbandry and Facility Design
- Evaluate potential role for private sector
- Evaluate potential role for academic sector

Action: Geneticist recommendations for modeling programs, e.g., Vortex and fish-oriented programs

Objective husbandry and facility standards

Referring to pg 29 of briefing book (husbandry and carrying capacity working group)

Quarantine: Isolation: Ideally, no pathogens in or out. Even in range country, wherever there is a potential for inlet/outlet contamination, sterilization/containment is necessary. In range country, water in more important than water out.

For range country, site-specific facility:

- treat for known disease problem, e.g., chytrid, maybe not necessary to cover all possible pathogens
- bleach systems as inexpensive method for range country?
- carbon and sediment prefilters on solid block, capable of eliminating small-sized pathogens

For facility outside of site-specific area

- wastewater recommendations
- boiling and/or bleach: standard sewage not acceptable
- non-water waste
- dead animals, cage décor, food, autoclave, incinerator or other heat, alcohol, formalin, etc.
- people, especially hands/feet
- work animal units in same order each time, dedicated footwear, gloves (at strictest level, could be per tank)
- This discussion is regarding disposing of waste; however, major sterilization attempts for cage contents “going in” can create pathogen naive populations that will have difficulties.
- pest prevention
- cockroach-tight
- screened vents, etc.

Veterinary care

- necropsy requirements
- histopathology
- gross
- amphibian-specific necropsy protocols

Quarantine procedures for parasites and pathogens

- All-kill vs. maintaining natural healthy internal flora/fauna?
- Write guidelines/protocol for rating pathogenicity.

Action: Form (global input) vet/path working group to advise

- food: pathogen risk with field-collected
- outdoor enclosure “fly-ins”.
- AP reminded us of chytrid on shrimp. WY studies on insects not showing pathogenic problems.
- Jean R: Pine needles, leaves work as good natural prophylactics
- DF: Items can be autoclaved. Tannic acid can also be purchased commercially. Tannic acid from various species actually have wide spectrum of efficacy. Some commercial forms ineffective.
- Global database husbandry manual to disseminate best practice ideas: e.g., tannic acid use, cultured algae, brown algae.
- Beat: Any special caecilian recommendations?
- DF: Carefresh substrate, certified sterile used for caecilians at University of Miami.

Housing

- maximize automation to minimize hands-on
- amphibian safe enclosure fabrication
- plastics, fiberglass, adhesives, etc., may be unsafe

Action: Make recommendations available as above.

Water quality

- Species specific, consider natural history
- pool of consultants will make best recommendations and add species accounts as needed
- Continuous flow-through or well filtered preferred over dump-and-fill or large changes (minimize chemical flux)
- Ammonia parameters, etc.: species specific sensitivities

Nutrition

- vitamin A as an emerging nutritional disease
- availability of small insects
- diversity of insects of various sizes
- C:P supplementation
- cold climate species problems

Action statement to research group: Mandate stomach content evaluation in necropsy protocols

- non-natural insect diets, pathology concerns, supplements: recommendations needed.

Safe transport

- Shipping guidelines: weather safety, turbulence issues with tadpoles (especially. non-stream species); increase water volume and cool.
- X ref. w/ IATA regulations.
- holes punched inside out; duct tape containers to bottom of internal box.
- Egg shipping can be easy, e.g., terrestrial eggs: moss cup, capped with more moss, narrow-necked bottle mostly water-filled and upright for aquatics.
- GM: Example of high-altitude species that has not successfully been brought down to low altitude.
- GM: Recommends that in any scenario with new species, group needs to research *in situ* parameters/field ecology prior to finally agreement to bring animal into captivity, and certainly in order to better understand what should be translated to captive husbandry parameters.
- JR: salamander-specific issues: for many species, very little water, (humid would be enough), temperature is very important, putting into hibernation is often good, using a freezer with ice.
- If you must field-collected inverts, collect from drier habitat to avoid chytrid. Beware collection of insects from poisonous plants.
- KZ: Collect inverts from rotting veggies in the stockroom of your local grocer.

Vertebrate foods

- To what extent is it healthy? Recommended as a supplement?

- Mark: Prophylactic salt baths: e.g., for aquatic foods (followed by rinse)
- Formalin dips not acceptable prophylactic!
- JR: Sirens have a particular way of feeding; eat a variety of sizes of foods, eat plants. Cryptobranchus need enormous amount of food; fish are good captive diets; also mentioned a variety of good aquatic food items.
- SP: If you keep the tank outside, the tank will seed itself with aquatic insects. Other species, supplement with mice for calcium.
- AP: Iridovirus a concern with using salamanders as food.

DF: Action: Recommendation to the organizational group that they appoint a research liaison ASG to coordinate various research needs:

- Qualifying existing holding capacity considering need for isolation.
- SP: Most zoos will not be able to comply with isolated building. Isolated room possible.
- AP: Recommends one room per species; one room, a few species from one locality. Prerelease testing is a good preventative measure.

Discussion rehash on the danger of error. Concern that directors won't put up money. Argument that we need to set a standard to which they need to comply.

SP: Diseases introduced into our countries will be coming from the pet trade, not us.

GM: If we are collecting from contaminated sites, we need to then accept that we are an increased threat.

Samuel Furrer: Goal might also be to send out animals to other countries as ambassadors, for research, etc. Release doesn't need to be primary goal.

DF: Set standards for animals that will and will not be released.

GM: Waterproof, all efflux treated, waste is pressure heated, shower in/out, dedicated uniforms, particle filtration on ventilation would help insect proof.

Include automated housing designs.

DF: In the interest of making sure that smaller institutions can be involved, maybe participating institutions should have a matching funds requirement for endorsed participation.

Action: Recommend matching funds requirement for endorsed participation.

Paul: Concern regarding Atlanta animals not meeting our now-recommended standards. It was agreed that these animals should not be used to restock, but instead wild animals should be translocated.

Action: Make statement to full group that husbandry group has concerns regarding procedures in existing programs.

Action: Situate appropriate water-in filtration for site-specific facilities.

- preferred insect proofing

- dedicated tools.

Action: Make recommendations to retrofit or build new facilities.

- KZ: Next step is to quantify holding capacity, but without species recommendations, we can't move. As baseline information is forthcoming, we will be able to work on this (i.e., on species by species basis).
- GM: Our current capacity, based on preferred standards, is zero outside of range country, but we can list places, e.g., Bob M for NA specimens.

Action: Space surveys for native species.

- GM: If we list what we know to be available now, we could present that to the group so that they can better understand the magnitude of the problem.
- JK: Amphibian TAG conducted a survey last year and 45/60 institutions responded.
- SP: We work with a lot of native amphibians outdoors. In-range work has much more flexibility for institutions
- GM : Any in-range facility only has to be concerned with keeping out the causal agent of decline and keeping them away from cosmopolitan collection.
- Gale M: Is taking animals out of the wild due to habitat destruction not included because it is not worded here (because we are talking about removing due to disease)?

KZ Action: Create recommendations for institutions expanding holding capacity Cross reference down to standards and husbandry.

- KZ: Increase capacity in range-countries as needed
- Bob Johnson: Research: there was discussion regarding creating regional centers to help anticipate needs.
- Coordinate with other ACAP divisions (Assessment, Research) to identify what we think will be the hotspots (areas of species concerns).
- Once those areas are identified, next step is to identify partners on both sides, from those who are able to receive the facilities and those who are able to implement the plan.
- This is one independent approach that we will be able to proactively implement. We can find people to meet that need or be ready to assist those who come to us.
- Link with financial support.
- Utilize existing zoo associations for the above support.

Training

- AZA and Jersey have amphibian biology courses. As funds allow, people are brought into the courses.
- Beat: DGHT started last year training centers for private and zoo staff, pet traders. At the moment is for Germany but we have founded a European-wide organization and have started to spread our training material. It has been translated to English in the UK,
- DF: In the US, the academic, zoo, private sectors don't communicate well. We should establish once-a-year a training seminar where we pull from the pool we already have developed and send them out to train.
- Do we need to make sure that we have an international consensus, vs. an AZA, Jersey, DGHT, etc., individual efforts/messages?

- AS: My main concern is that the training is all expensive. Creating something new is necessarily the direction to go unless we can make it cheaper and easier for people to attend.
- GM: I'm involved in developing/teaching the Jersey course. The plan is to run it in Australia the following year; we may find a few other places to move it to. If people take this course, they may be able to move out to internships in other facilities or build facilities.

Action: Have coordinators for formalized amphibian courses communicate materials, information to ACAP Best Practices.

Action: Develop internship funding to bring people to classes.

- Look at decentralizing training. Some basic, rapid-response training can readily be done in range countries.
- Informal needs to be cultivated, involves trust building, needs someone who is good at coordinating such things.
- KZ to GM: How do you determine where the most need is for training?
- GM: Australia next due to existing infrastructure, more amphibian facilities than Jersey.

Action: Determine global/regional need and capacity for training.

- German Corridor: Tailor course for regional needs.

Action: Identify other (regional) sources of expertise for existing training courses.

Role of the private sector

- regulation
- Mark: reimbursement or funding for services needed
- GM: People in the private sector will work without pay and will go out of their way.
- Bob: That's true, but some compensation would be good. People who could dedicate a room would be happy to do it. It may not be a monetary need, sometimes just recognition.
- Andy Snider. There is a great deal of mistrust in institutions regarding private sector. Private sector upset that they are only wanted for expertise. In recent herp programs, there have been problems. Croc TAG privates agreed to regulations but did not. There is an issue of enforcement.
- DF: With clear contracts, letters of recommendations this shouldn't be a problem.
- AS: In the croc TAG, there are animals we can't recover from individuals.
- GM: You may lose a few animals from a few bad individuals, but on the whole, if you involve all of the people in the capacity and the people who have earned trust are given more responsibility, you may get people who can build facilities that rival zoos. And remember, problems have happened in zoos, too.
- If you have ten people who have amphibians and they're all producing them, one ends up selling out the back door. The outcome is a net good.
- AS/KG: Not if the country of origin gets upset.

Action: Consult attorney regarding development of legally binding contracts with private sector participants.

- KG: This won't work on a global level
- GM: Australia already has functional mechanisms.

Action: Survey for regional interest and enforcement issues.

- ER: Already contract links between government and private sector in Great Britain. But the curator of the London Zoo doesn't want to deal with the private sector and a lot of tadpoles are dying.

Action: Draft CBSG/WAZA statement that encourages collaboration with private sector.

- This needs to be a strong action statement.
- If animal is owned by government, that's a strong statement. The request should come from CBSG, not individual zoos. If CBSG sanctions, it's not for zoos to decide.

Action: Draft CBSG statement that promotes a liaison with the private sector and charge CBSG with the dissemination of this statement to institutions

Kevin Buley on TSA: The vast majority of key animals in current holding for those species are in the private sector. On top of that, the vast majority of expertise is also in the private sector. So there is a huge reservoir of knowledge that the task force wanted to bring in. The initial meeting acknowledged the need and the private sector was in attendance.

Over the past five years it's been a far from easy relationship. There are many zoos that refuse to work with the private sector, but many are zoos that are important to the program. In the private sector there are problems with the animals moving around and problems of selling them to the private sector. Private individual signs agreement re ownership of the animal, its offspring, responsibility to send records, vet care. Some people have fallen out. You start off with a large number that whittles down to a core. Still, there are people working for a common cause that wouldn't have worked together before.

- Initial screening process of person and facility (or sometimes member approval)
- In Europe a strong existing foundation that was a small step to link studbooks with the US, TSA with various committees' ethics.
- Bruce Weissgold (USFWS-CITES) facilitates
- Don't address biosecurity, obviously fecundity issues different.
- AS: Monetary aspect different, lots of money changes hands
- KZ: Amphibian potential for husbandry, research benefits from private facilities
- KG: Confiscated turtles, in surpluses too large for zoos to hold, are sold. A core group has been developed, so the net value is positive. Did some players drift due to lack of attention/feeling involved?
- KB: Yes.
- Elmar Meier: One of the world's turtle breeders, has been provided with facilities at the Muenster Zoo for breeding animals resulting in a very good relationship.
- BJ: It's unlikely that the frogs would need to be sold to make up for costs.

- BM: It would be hard to freeze *A. zeteki* frogs.
- MW: Can't imagine this working without any compensation, so something as incentive?
- DF: Agree: not necessarily paid, but lender breeding for stocking a zoo or research, or in terms of helping with electrical costs, food costs, a maintenance stipend.
- Mike, KZ: More pay is appropriate.

Action: Form joint committee zoo/private/other to evaluate and modify TSA model to submit to all parties for approval.

- KZ: Good representatives outside of zoos for this? Regions of the world? IAD, DGHT, Japan Zoo: Eric Anderson/NAIB.
- Paul: Treewalkers International, proposing accreditation process.
- DF: Committee, nomination, formal process for selecting private participants – with internet, there has been an explosion of fallacy. We must have a [bullshit filter] mechanism.

Community involvement

- GM: Can we take a step back from threatened species because the biggest response we've had from community is from non-threatened local species, through which we've developed a vested network.
- Classroom tadpoles, group frog searches, other activities. This outreach endears your institution to the community at large and gets them primed for the next step.
- Funding and sponsorship is easier if there is big community involvement.
- Bob: Sister-school relationships. Also, zoo/community involvement in projects can help with institutional involvement, skills exchange.
- DF: This body should develop a packaged Powerpoint presentation
- GM: Dynamic website a powerful tool.

Action: Seek involvement of regional zoo associations and herp societies in developing and delivering information via websites, Powerpoint, etc.

SPECIES SELECTION NOTES

Facilitator: Bob Lacy (expertly assisted by Bob Johnson and Tim Skelton on the flipchart)

Recorder: Richard Gibson

Presenter: Graeme Gillespie

Objective: Develop species and site priorities for ex situ conservation action

Group discussion considered the following pertinent points:

- Site prioritization considered unnecessary: This should fall out through species selection. This is in line with the established GAA process.
- Question raised: Shouldn't we consider species cohorts in national parks, etc?
Consensus answer: Multiple species in same location, selected through species-selection process, will lead to site priorities falling out.
- It was suggested that the word 'species' be replaced *with* 'taxon' to allow for any and all taxonomic units to be considered. This was agreed by consensus.

- Primary process should therefore be taxon selection followed by secondary prioritization.
- Initial selection criteria should be from a global perspective, secondary weighted prioritization and, tertiary, feasibility processes can be carried out regionally according to local priorities and sensitivities.

Therefore group Objective re-written:

Develop rigorous criteria to determine whether ex situ conservation action is appropriate for a specific taxon, a prioritization process and feasibility evaluation.

Strategy: Review criteria for evaluation and form decision tree

- NB: The existing GAA recommendations for *ex situ* work are not based on any established or consistent process. This objective and strategy are therefore of critical importance in the global implementation of ACAP.

Step 1) The group carried out a brainstorming exercise to ensure inclusion of all relevant criteria considered necessary for evaluation to allow taxon selection.

- Question raised: Where does this process begin? Before or after selection has been ‘made’ by other authorities: i.e., government recommendation to undertake program followed by this process to determine suitability and feasibility?
Consensus answer: Process could equally work in either direction; with a government not being proactive and awaiting recommendations from the ASG.

Brainstormed criteria:

- IUCN Red List status – globally and/or regionally.
- Newly discovered species threatened at local/national level.
- Does recommendation for *ex situ* activity exist from recognized authority?
- Knowledge of threats.
- Potential reversibility of threats.
- DD and NT species threatened by chytrid or other threats.
- Clear goals and roles for *ex situ* program.
- Evaluation methodologies for determining success.
- Clear and approved exit strategy.
- Climate change.
- Socio-economic importance.
- Cultural importance.
- Taxonomic and/or biological uniqueness.
- Legal support.
- Distribution and range.
- Marketability.
- Local capacity to respond.
- Triage – best use of funds – ‘bang for your buck’.

Step 2) The group reviewed the existing DAPTF guidelines edited and expanded at CBSG workshop in Washington D.C. August 2005 and a proposed draft decision-making process presented by Kevin Buley.

- KB introduced and explained the proposed process of **two phases**:
Phase One: yes/no answers for selection purposes.
An end answer of NO means no need to carry on to Phase Two.
An end answer YES means the taxon is appropriate to consider for *ex situ* management and therefore continue to Phase Two.
Phase Two: weighted answers to allow prioritization of taxa for which *ex situ* conservation is considered appropriate.
- Question raised: What happens when our answers are ‘Data deficient’ i.e. we don’t know?
Consensus answer: This identifies knowledge and/or capacity gaps which can be fed back to ASG with request for help and/or action from other areas of expertise.
- Question raised: Should prioritization be carried out first followed by yes/no justification?
Consensus answer: Either is logical but initial ‘first cut’ reduces ‘effort’ for prioritization process.
- Observation on Phase One: Some questions refer to feasibility rather than justification. It was, therefore, suggested and agreed that the first phase of questions be split to form a third phase considering feasibility.
- **Three phase process:**
Phase One: first-cut selection, carried out by ASG and collaborators from global perspective.
Phase Two: prioritization: also by ASG and collaborators at global/regional perspective
Phase Three: feasibility ‘reality check,’ carried out through CBSG/WAZA and institutions from proposed program perspective.
- Question raised: How do we ensure that model/husbandry research/disease research needs get the required ‘mandate’ to proceed through Phase One?

Problems to resolve

- Phase Two: Prioritization process may leave species out owing to resource deficiencies. There are legal and ethical implications to this.
- Species/genera with little to distinguish between them may all score low in prioritization. *Genus* may therefore need to be put through selection process first, followed by prioritization of species within a previously prioritized genus.
- Species assemblages may have cultural significance as a community of ‘frogs’ while no individual species does. This can be interpreted as skewing the scoring system. Therefore, does weighting need reviewing? Do we need all the questions?
- Explanatory note required: Phase 2
Question 6: Need to explain in pre-amble why DD is given a higher score than LC.
Question 7: Explain purpose of this question acknowledging mix of phylogeny/taxonomy.

Question 9: Explain that the ecological role of a taxa will often (usually?) be ‘unknown’ and why that doesn’t matter.

- Explanatory note required: Phase 3
Clarify that ‘feasibility’ process is also a self-evaluation of readiness to initiate.

Strategy: Begin applying to 427 IUCN Cr species

Five species were run through the section/prioritization process to test the system. Minor improvements were made along the way.

Bufo periglenes (rediscovered chytrid-free wild population):

Questions 4-12: 2, 10, 10, 3, 0, 0, 10, 10, 10 = **55/100 - reviewed weighting = 75/120***

Litoria aurea

Questions 4-12: 20, 10, 6, 3, 0, 0, 10, 0, 0 = **49/100 - reviewed weighting = 65/120***

Leptodactylus fallax (Dominican population)

Questions 4-12: 4, 10, 8, 0, 10, 3, 10, 10, 0 = **55/100 - reviewed weighting = 73/120***

Atelopus spp. (newly discovered species)

Questions 4-12 : 4, 10, 4, 3, 0, 0, 0, 0, 5 = **26/100 - reviewed weighting = 40/120***

Atelopus exiguus

Questions 4-12 : 4, 10, 10, 3, 0, 0, 0, 0, 0 = **27/100 - reviewed weighting = 47/120***

*doubled weighting on questions 5 and 6. This elevates importance of Conservation Role *ex situ* (especially that of the Ark) and the extinction risk (i.e., IUCN Red List category)

The system needs extensive testing with particular respect to DD species and the weighting of the prioritization scoring system. However, in order for this process to gain international credibility and be accepted as the standard it must receive peer review and approval.

Strategy: Obtain ASG formal approval and adoption of selection process

Actions: To finalize workshop output document:

- Expand workshop output with summary text to create final workshop report draft for circulation (mid-March) among group and approval (end March). Graeme Gillespie
- Submit selection process as ‘discussion paper’ to ASG and WAZA for distribution, peer-review and regional testing (end April). Bob Lacy
- Selection process improvements made and circulated (via email) to this working group for agreement (mid-May). Kevin Buley
- Test and collect suggestions for improvements at regional CBSG/WAZA workshops (May, June, August, September). Bob Lacy and others
- Make final improvements and circulate to this working group (via email) for agreement (mid-October). Kevin Buley
- Finalize and seek endorsement from ASG (end October). Bob Lacy

Strategy: Send list of prioritized species to ASG field representatives for review

- This strategy point is inappropriate at this time as insufficient knowledge and expertise in the meeting to assess all Cr species of amphibians.

Action: Following adoption of the selection process, ASG/CBSG/WAZA should implement regional section and prioritization process on global scale. ASG/CBSG/WAZA

Strategy: Determine ACAP partner working groups and others to involve in future decision-making during GAA reviews.

- Who and how is the selection and prioritization process carried out?
- Important to capture regional information not included in GAA assessments.
- GAA-led process exploiting the existing international network of experts utilized in the GAA.
- Which species go through this process? Is a prior process needed to decide which species should be run through the system? That is, how do we reach the position where we know which species need to have *ex situ* conservation even considered by our process?
- Start with 427 Cr species with existing ‘mandate’ and any species with known proposed *ex situ* conservation activities by approved authorities.
- At the same time make it explicit why we haven’t yet assessed other species – i.e., no mandate exists – with the expectation that this will generate further mandates from appropriate authorities.
- Evaluations with the selection and prioritization process should be available through the web for information and improvement purposes.

Question: Who decides who works with what?

- Explanatory note required: Prioritization is NOT a firm decision, but a guiding practice. Flexible rigidity allows species scored as low priority to be undertaken for other reasons according to common sense, political pressure, economic considerations etc.
- Take-home thought: ‘You can’t use paper napkins in the rain.’ (Tim Skelton, Head Keeper, Herpetology, and Philosopher for the County of Bristol)

RAPID RESPONSE NOTES – no notes provided