

Prioritization Workshop for Amphibian Species in Hong Kong and Guangdong



Hong Kong

22-23 May 2008

Schedule for the Hong Kong and Guangdong Amphibian Workshop
香港兩棲動物工作坊日程

Date 日期	Schedule 日程	Action 負責人
22 May, 2008 (Thursday), Venue: Evergreen Classroom 長青課室		
8:30	Registration 報到	
8:45 – 9:00	Welcome 歡迎	Suzanne Gendron OP
9:00 – 9:30	Presentation 簡報 - Amphibian Ark	Kevin Jonhson Amphibian Ark
9:30 – 10:00	- Overview of amphibian status in China 兩棲動物在中國的情況	Prof. Xie Feng 謝博士
10:00 – 10:30	- Overview of amphibian status in Guangdong 兩棲動物在廣東的情況	Dr. Gong Shiping 龔博士
10:30 – 10:45	Break 休息	
10:45 – 11:15	- Threats and Conservation Priorities for Amphibians in HK and South China	Dr. Michael Lau 劉惠寧博士 KFBG 嘉道理農場暨植物園
11:15 – 11:45	- Overview of amphibian status in Hong Kong 兩棲動物在香港的情況	AFCD 香港漁農自然護理署
11:45 – 12:15	- Romer's Tree Frog Project in KFBG	Mr. Paul Crow KFBG 嘉道理農場暨植物園
12:30 – 13:30	Lunch 午飯	
13:30 – 15:30	Prioritization – discussion 優先化 – 討論	ALL
15:30 – 15:45	Break 休息	
15:45 – 18:00	Prioritization – discussion 優先化 – 討論	ALL
18:30 – 21:00	Welcome Dinner 歡迎晚宴	Invited Guests 嘉賓

Schedule for the Hong Kong and Guangdong Amphibian Workshop
香港兩棲動物工作坊日程

Date 日期	Schedule 日程	Action 負責人
23 May, 2008 (Friday), Venue: Nautilus & Seahorse Room 鸚鵡螺及海馬廳		
9:00 – 10:30	Prioritization – discussion 優先化 – 討論	ALL
10:30 – 10:45	Break 休息	
10:45 – 12:30	Prioritization – discussion 優先化 – 討論	ALL
12:30 – 13:30	Lunch 午飯	
13:30 – 15:00	Prioritization – discussion 優先化 – 討論	ALL
15:00 – 15:15	Break 休息	
15:15 – 17:00	Prioritization – discussion 優先化 – 討論 Discussion – follow up actions / recommendations 討論 – 跟進工作 / 建議 Conclusion 總結	ALL



**Prioritization Workshop for Amphibian Species in Hong Kong and Guangong
Ocean Park, Hong Kong
22-23 May 2008**

Workshop Summary

Twenty-two participants representing seven organisations gathered at Ocean Park in Hong Kong on May 22nd for the start of a two-day amphibian workshop. The two main aims of the workshop were to present a series of papers outlining some of the amphibian conservation activities that are currently underway in Hong Kong and Guangdong Province, and to attempt to prioritize all amphibian species from the two places to highlight those species that may require conservation-oriented follow up and for potential *ex situ* conservation programs.

The organisations represented at the workshop were:

- Agriculture, Fisheries and Conservation Department, Hong Kong SAR Government
- Amphibian Ark
- Chengdu Institute of Biology of the Chinese Academy of Science
- University of Hong Kong
- Kadoorie Farm & Botanic Garden
- Ocean Park Hong Kong
- South China Institute of Endangered Animals

The high level of institutional representation at this workshop ensured that participants with a wide range of *in situ* expertise contributed to the species prioritization process, and that relevant stakeholders were included.

A number of presentations were given during the morning of the first day, and this was a great way for the presenters to share the work they are involved in with the other participants. The presentations included:

- Amphibian Ark and the Species Prioritization Process – Kevin Johnson (Facilitator), Amphibian Ark
- An Overview of the Amphibian Status in China – Prof. Xie Feng, Chengdu Institute of Biology of the Chinese Academy of Sciences
- Overview of the Amphibian Status in Guangdong – Dr. Gong Shiping, South China Institute of Endangered Animals
- Threats and Conservation Priorities for Amphibians in Hong Kong and South China – Michael Lau, Kadoorie Farm & Botanic Garden
- An Overview of the Amphibian Status in Hong Kong – Simon Chan, Agriculture, Fisheries and Conservation Department

- Romer's Tree Frog Conservation at Kadoorie Farm & Botanic Garden – Paul Crow, Kadoorie Farm & Botanic Garden

The scope of the amphibian species prioritization workshop was all amphibian species currently and historically recorded in Hong Kong and Guangdong. This included 24 species that occur in Hong Kong, with one of these, *Philautus romeri*, being endemic. The species from Hong Kong included 2 Endangered, 2 Near Threatened, 2 Vulnerable, and 18 Least Concern species. All of these species, except for *Philautus romeri* also occur in Guangdong. An additional 42 species that occur in Guangdong, but not in Hong Kong, were evaluated during the workshop.

Of the 66 species evaluated, three species, *Andrias davidianus* (Chinese Giant Salamander, 大鯢), *Philautus romeri* (Romer's Tree Frog, 香港小樹蛙) and *Cynops orphicus* (Dayang Newt, 潮汕蠺蟪) were ranked considerably higher than the remaining species. A number of research projects are underway in China with *Andrias davidianus* and considerable experience exists with commercial farming of the species. A captive program already exists for *Philautus romeri*, with Kadoorie Farm & Botanic Garden and AFCD carrying out *in situ* conservation studies and Ocean Park involved in captive breeding. AFCD are also coordinating territory-wide monitoring of the species.

Of the remaining species, thirteen species were identified as requiring some form of conservation research program to be established, twenty-two were identified as potentially being used for conservation education programs, and the remaining twenty-seven were identified as not requiring any sort of *ex situ* conservation program at this stage.

A number of actions were identified as being required after the workshop with regard to increasing the *ex situ* management of amphibians in Hong Kong and Guangdong, and within China. These included:

- Continue collaboration between all stakeholder organisations and groups, and ensure that communication channels remain open for sharing of results and ideas.
- Establish regular sampling for chytrid both in the wild and in imported and farmed amphibians. Noted that University of Hong Kong already carries out some chytrid sampling work, and discussions with the Agriculture, Fisheries and Conservation Department may lead to a wider sampling regime that could be implemented.
- Develop action plans for priority species, including Romer's Tree Frog which is already being managed. Agriculture, Fisheries and Conservation Department staff agreed to draft an action plan and circulate to appropriate participants for review and feedback.
- Determine analogue species to be used to gain additional *ex situ* management expertise, for those high priority species where little is known about the captive husbandry.
- Participants to meet again in approximately six-eight week's time to review progress and identify next steps.
- Translate prioritization tool into Chinese, so it can be used more widely throughout China.

- Establish *ex situ* populations of analogue species to gain experience in husbandry and captive reproduction.
- Establish further networks in China to be involved in future amphibian species prioritization workshops.
- Undertake further species prioritization work elsewhere in China, undertaken by Chinese-speaking facilitators.

Kevin Johnson
Amphibian Ark
24 May 2008

Summary of Presentations

22 May 2008

Kevin Johnson, Amphibian Ark

Amphibian Ark

In September 2005, an amphibian summit was held in Washington, D.C. from which two major outcomes resulted. The summit called for the development of an amphibian conservation action plan and an amphibian specialist group. The World Association of Zoos and Aquariums joined the International Union for the Conservation of Nature Species Survival Commission to form Amphibian Ark. Amphibian Ark was created to assist with *ex situ* conservation efforts and focuses only on amphibian species that cannot be safeguarded in nature. This program has produced some successes in Panama where it is likely that several species would have been extirpated if not for *ex situ* efforts. Amphibian Ark coordinates *ex situ* programs and leads training programs in taxon management. Amphibian Ark focuses on short-term *ex situ* management to ensure long-term survival by engaging in captive breeding and research. The approach of Amphibian Ark emphasizes that *ex situ* programs should occur within a target species' range. The primary steps for engaging in such a program include: (1) determining species priorities for conservation; (2) securing state approval to work with the species; (3) implementing *ex situ* program; (4) collaborating with partners. Collaboration can be challenging in some regions. For example, it has been difficult to find North American or European organizations, which have adequate financial resources, to partner with the *ex situ* program in Costa Rica.

Ex situ programs have varied in their level of success. In Australia, the grass frog was threatened due to habitat destruction. A successful *ex situ* program for this species permitted reintroduction into protected areas. On the other hand, while the Australian corroboree frog breeds in captivity, ongoing habitat destruction prevents its reintroduction.

Amphibian workshops led by Amphibian Ark in Asia have been held for Australasia, Malaysia, and Thailand. A workshop for Indonesia is planned for late summer 2008. With each workshop, the decision tree for prioritization of species is revised and refined. Taxon prioritization evaluates three factors for each species: risk of extinction, phylogenetic significance, and cultural/social importance. The highest final score for a species in some workshops may be 30 but can also range up to 70. After prioritization scores have been finalized and agreed upon by workshop participants, they become available to anyone on the Amphibian Ark website. In the future, Amphibian Ark staff hope to incorporate the information into the Global Amphibian Assessment.

Dr. Gong Shiping, China Institute of Endangered Animals

Overview of Amphibian Status in Guangdong

At present there are 66 species known from Guangdong Province and only one of these, the Dayang newt (*Cynops orphicus*) is endemic. Four are listed as CITES I species. The evolving taxonomy has created confusion as there are many synonyms for the same species. Primary threats to amphibians in Guangdong include overcollecting and illegal trade, habitat destruction including degradation due to pollution, and introduced species. Dr. Gong and colleagues conducted a trade survey and interviewed local people from July 2006-April 2008. Eight species regularly documented for sale in these markets were *Paramesotriton hongkongensis*, *Rana megacephalus*, *Paa spinosa*, *Rana guentheri*, *Fejervarya limnocharis*, *Hoplobatrachus chinensis*, *Pelophylax nigromaculata*, and *Bufo gargarizans*. All species

were being sold as food except for *P. hongkongensis*. Some species like *Hoplobatrachus chinensis* are being farmed, but wild animals are preferred. Protected species have been observed in markets but there is no enforcement.

Much of the recent habitat destruction has been caused by logging and hydropower stations. Secondary forests have been logged and replanted with *Eucalyptus* species, which are non-native and provide poor habitat for amphibians. Some illegal logging has occurred that potentially threatens important habitats. For example, a tiger reserve in northern Guangdong was deforested. Pollution continues to degrade habitats for amphibians. Primary sources of pollution are pesticides from farmlands that contaminate lowland habitats and acid rain which can impact amphibian habitats regardless of elevation. Monitoring of pH in precipitation in Guangdong has revealed levels as low as 3.2 (lower than the acidity of vinegar) and that levels in many regions are below the tolerance limits of most amphibians. Small hydropower stations continue to pose threats to amphibians in Guangdong. These stations change the flow of rivers and excessive extraction of water can cause some rivers to run dry. Power plants also cause high mortality by entrapping amphibians in concrete channels and storage pools. For example, hundreds of amphibians drown every day in one 5 m deep pool associated with a hydropower plant from which they are unable to escape.

Introduced, invasive species are increasingly representing a potential problem for amphibians in Guangdong. The red-eared slider (*Trachemys scripta*) and the American bullfrog (*Lithobates catesbeiana*), both from North America, have appeared in many locations throughout the province, most likely as a result of released pets and food animals. *Lithobates catesbeiana* has established one viable population near Huanghua Mountain. Researchers will continue to monitor this population.

Future conservation of amphibians will depend upon strengthening enforcement of existing regulations. Experts should work with regulators and managers to ensure that threatened species receive adequate protection. Long-term monitoring of amphibian populations will be essential for documenting declines in species whether due to habitat destruction, disease, or overcollection. Such monitoring may also help to identify the occurrence of illegal activities, such as the use of electroshocking to catch frogs, which is ongoing in Guangdong despite existing regulations prohibiting the technique. Further research is needed on the effects of hydroelectric power stations, pesticides, and acid rain. In the future, captive breeding may be necessary for some critically endangered species but issues associated with local genetics, sources, and releases need to be considered.

Dr. Michael Lau, Kadoorie Farm and Botanic Garden

Threats and Conservation Priorities for Amphibians in Hong Kong and South China

The most serious threat to amphibians in Hong Kong and South China remains habitat destruction and degradation. Agricultural expansion has led to a loss of habitats, as has conversion of forests to rubber, *Acacia*, and *Eucalyptus* plantations even in nature reserves. Hydropower dams have been constructed, even in protected areas. Many such projects have not gone through proper environmental impact assessment procedures. Streams are often completely dry below the catchwaters associated with hydropower operations. As well as completely eliminating aquatic habitats, forest microclimate is also affected. In Hong Kong, changes in agricultural practices caused the loss of *Occidozyga lima*, which formerly bred in rice paddies and other shallow water agricultural plots. Many lowlands are being developed as land is expensive and there is economic incentive to develop. Landfills are filling up which may lead to development of additional land for waste or transport of waste to China. This problem reveals a need for personal responsibility for reducing waste.

Environmental contaminants, particularly pesticides and fertilizers, probably have caused the loss of and threaten existing populations of amphibians. Air pollution levels continue to rise in the region, and we must wonder if air pollution will eventually impact amphibians. Overharvesting of amphibians for food, traditional medicine, and pets remains an important concern. The scale of harvest varies among species. South China has few species that are important for traditional medicine but the region imports many species from other parts of China. The importance of infectious diseases to amphibians in Hong Kong and South China remains unknown. The amphibian chytrid, *Batrachochytrium dendrobatidis*, has been detected in Okinawa, Japan and on Java Island in Indonesia. Thus far, screening for *B. dendrobatidis* in Hong Kong has failed to detect it and to date no screening has been conducted in South China. Nothing is known about other important diseases of amphibians in this region.

There are a number of conservation priorities that should be addressed. We need improved taxonomic resolution in order to identify cryptic and synonymous species. Molecular, acoustic, and larval data would aid in further defining species. Comparison of specimens would be useful and could be accomplished by exchanges of specimens between neighboring countries. Another priority should be to identify and safeguard ecologically important areas for amphibians. Many nature reserve and protected areas occur at higher elevations, but are there major gaps in the species we are currently protecting? Lowlands and island are not protected to the same degree and islands can be important refuges for relict species. We should strive to improve our biological knowledge and collection of baseline data. In particular, we need more surveys, ecological studies, and long-term monitoring.

Conservation will not be accomplished merely by the collection of data. We must devote time and energy to capacity building within communities for protection of areas important to amphibians through networking and partnerships. It will be important to link our conservation goals to other priorities within communities. Community-based efforts may encourage young people to become herpetologists. Education and raising awareness about threats to amphibians must be a part of a comprehensive conservation program. The Year of the Frog campaign represents a good example of the types of efforts that can be made in these areas. It is essential to generate public support to ensure that conservation will happen.

Captive breeding may become an important tool in the future to safeguard the futures of some amphibian species, but this approach should only be pursued under two conditions: (1) when in situ conservation cannot ensure survival, and (2) when time is needed for a threat to be removed. Captive breeding may also provide insurance against unpredictable and sudden declines. However, these programs present many challenges, such as having a comprehensive understanding of the ecology of all life stages and of housing requirements, and determining what to do with the many offspring that may be produced. Captive breeding programs take many years to develop and maintain and thus many resources. Where such programs are undertaken, it is prudent to spread the captive collection among several institutions. As such, partnerships are important.

Simon Chan, Hong Kong Agriculture, Fisheries, and Conservation Department

Amphibians of Hong Kong – Distribution and Conservation Status

Despite Hong Kong's small area, it possesses a wide variety of habitats. Of 24 species, probably two, the Short-legged Toad (*Xenophrys brachykolos*) and Romer's Tree Frog (*Philautus romeri*), are endemic. Since 2002, the Agriculture, Fisheries, and Conservation Department (AFCD) of the Hong Kong Government has been conducting surveys on the diversity, distributions, and relative abundances of amphibians in Hong Kong. Surveys have been conducted in 1 km² grid cells selected from the 1,600 grid cells encompassing the region.

Species are classified as rare if they occur in 1-8 cells, as uncommon if they occur in 9-16 cells, and common if detected in greater than 16 cells. Using data obtained this way from surveys, AFCD staff are able to evaluate restrictedness of species and identify species of special conservation concern. Twenty species are ranked common, one species (*Limnonectes fujianensis*) is uncommon, two species (*Amolops ricketti*, *Paa spinosa*) are rare, and the status of one species (*Occidozyga lima*) is uncertain. This approach has also allowed AFCD to identify 18 amphibian hotspots in Hong Kong, such as Pui O marsh, and locations of species of conservation concern.

Three species, *A. hongkongensis*, *Paramesotriton hongkongensis*, and *P. romeri* are protected under the Wild Animals Protection Ordinance. Forty percent of Hong Kong SAR is protected as country parks and other protected areas. Action plans have been developed for *P. romeri* and *P. spinosa*.

AFCD has been involved with two studies recently in Hong Kong. They screened populations of amphibians on Hong Kong and Lantau islands and in the New Territories for chytrid fungus but did not detect it. They are currently participating in a study of genetic diversity of native species in Hong Kong including *P. romeri*, *X. brachykolos*, *A. hongkongensis*, *A. ricketti*, and *P. hongkongensis*.

Paul Crow, Kadoorie Farm and Botanic Garden

Romer's Treefrog Conservation at Kadoorie Farm and Botanic Garden

Kadoorie Farm and Botanic Garden (KFBG) is a 148-ha site that was heavily deforested in the 1950s. Much of the forest has recovered and habitats are improving. Education is a key feature of the work at KFBG and an important component of *ex situ* conservation. The *Philautus romeri* conservation program began because of construction of the airport. Two conservation areas were established at KFBG and *P. romeri* were translocated from Chep Lap Kok. Initially populations did well, but there has been less success in recent years. There was some destruction of artificial breeding pools by wild pigs but larger, stronger pots were installed. However, those close to a stream became inhabited by *Paa exilispinosa* and it is likely that these animals were preying on or at least deterring *P. romeri* from breeding in the pools. Pools were elevated to prevent access by *P. exilispinosa* but *P. romeri* tended to avoid these. Pools may need to be moved further from the stream.

Difficulties with maintaining artificial breeding sites have demonstrated that conservation actions need to be sustainable. In the future, concrete cast pipes may be used as pools. KFBG is exploring recently acquired land parcels that include some abandoned old rice paddy and terraced agricultural plots to ascertain if these sites may provide a more sustainable habitat option for the species.

Prof. Xie Feng, Chinese Academy of Sciences

Conservation Needs of Amphibians in China

In current studies of amphibians in China, it is important to consider both biogeography and conservation. China has high endemism (>220 of approximately 350 species) and many relictual species of amphibians. Using Global Amphibian Assessment data, threat level calculations, and GIS analysis, they conducted a study to identify hotspots of diversity and of threatened species. Highest species diversity is in Hainan Island, the Wuisan Mountain area, and the Nanling Mountain area in China. In 2004, 1 species was extinct, 8 were critically endangered, and 65 were data deficient. Fifteen new species have been discovered since 2004. Approximately 23% of species in China need immediate conservation measures. Salamanders are the most threatened order of amphibians and China, as well as globally.

Sixty percent of salamander species in China are threatened. In particular, for the most threatened species, *Andrias davidanus*, 50% of populations have been extirpated and 73% of the species original range has been lost. *Andrias davidanus* is the most critically endangered species despite being widely distributed. *Paa* species are more threatened than *Amolops* or *Rana*. Most of the threatened species are in southern Hainan Island and western China, and most do not occur in the biodiversity hotspots, which are well-known currently.

Areas of heavy harvesting of amphibians are distributed throughout southern and central China. Eighty-four species are impacted by collection for food, medicine, and pets. Wetlands, forests, and streams are the most threatened habitats. Invasions by exotic species have been most severe in lakes. Bullfrogs have been found at up to 2,000 m elevation. *Xenophrys* were extirpated from one site by an introduction of the American bullfrog. Chytrid fungus was found in one American bullfrog in Yunnan last year. Rainbow trout farming may pose problems for amphibians due to escapes. Pollution should have a greater impact as human populations and urbanization increases.

There are many challenges facing the conservation of amphibians in China. There is a need to protect important sites and habitats. Harvest of species needs to be reduced to sustainable levels. More scientific research is needed including monitoring of populations and ecological information. A plan should be developed for how to respond in the event of an amphibian chytrid outbreak. There should be increased government responsibility for managing amphibians. At present only *A. davidanus* has dedicated conservation reserves but that still is not protecting populations.

Drafting of the China Amphibian Conservation Action Plan is ongoing.

Summary of Species Prioritization

23 May 2008

Five species of highest conservation priority in Hong Kong and Guangdong:

<u>Species</u>	<u>Score</u>
<i>Andrias davidanus</i>	65
<i>Philautus romeri</i>	47
<i>Cynops orphicus</i>	34
<i>Xenophrys brachykolos</i>	26
<i>Philautus ocellatus</i>	24

The conservation status and prioritization rankings for all species in Hong Kong and Guangdong are given in Table 1.

Table 1. Conservation status and prioritization scores for all species in Hong Kong and Guangdong. A worksheet describing all parameters used to assess species prioritization can be found on the Amphibian Ark website:

<http://www.amphibianark.org/prioritizationworkshops.htm>

Genus	Species	Distribution	IUCN Status	Priority score
<i>Andrias</i>	<i> davidianus</i>	GD, GX	Critically Endangered (CR)	65
<i>Philautus</i>	<i> romeri</i>	HK	Endangered (EN)	47
<i>Cynops</i>	<i> orphicus</i>	GD	Endangered (EN)	34
<i>Xenophrys</i>	<i> brachykolos</i>	GD?,HK	Endangered (EN)	26
<i>Philautus</i>	<i> ocellatus</i>	GD, HN	Endangered (EN)	24
<i>Ichthyophis</i>	<i> bannanicus</i>	GD, GX	Least Concern (LC)	23
<i>Bufo</i>	<i> cryptotympanicus</i>	GD, GX	Near Threatened (NT)	22
<i>Paa</i>	<i> spinosa</i>	GD,GX,HK	Vulnerable (VU)	22
<i>Ophryophryne</i>	<i> pachyproctus</i>	GD, GX	Least Concern (LC)	21
<i>Fejervarya</i>	<i> cancrivora</i>	GD?, GX	Least Concern (LC)	20
<i>Amolops</i>	<i> hongkongensis</i>	GD,HK	Near Threatened (NT)	17
<i>Paa</i>	<i> exilispinosa</i>	GD,HK	Vulnerable (VU)	17
<i>Xenophrys</i>	<i> mangshanensis</i>	GD	Near Threatened (NT)	17
<i>Occidozyga</i>	<i> lima</i>	GD,GX,HK,HN	Least Concern (LC)	16
<i>Rana</i>	<i> chloronota</i>	GD,GX,HK,HN	Least Concern (LC)	15
<i>Xenophrys</i>	<i> giganticus</i>	GD?	Vulnerable (VU)	15
<i>Paramesotriton</i>	<i> hongkongensis</i>	GD,HK	Near Threatened (NT)	14
<i>Rana</i>	<i> nigromaculata</i>	GD	Near Threatened (NT)	14
<i>Rugosa</i>	<i> tientaiensis</i>	GD	Near Threatened (NT)	14
<i>Tylototriton</i>	<i> asperrimus</i>	GD, GX	Near Threatened (NT)	14
<i>Amolops</i>	<i> ricketti</i>	GD,GX,HK	Least Concern (LC)	13
<i>Bufo</i>	<i> andrewsi</i>	GD, GX	Least Concern (LC)	13
<i>Bufo</i>	<i> gargarizans</i>	GD, GX	Least Concern (LC)	13
<i>Leptolalax</i>	<i> liui</i>	GX,GD, HK	Least Concern (LC)	13
<i>Vibrissaphora</i>	<i> liui</i>	GD, GX	Least Concern (LC)	13
<i>Xenophrys</i>	<i> kuatunensis</i>	GD	Least Concern (LC)	13
<i>Xenophrys</i>	<i> minor</i>	GD, GX	Least Concern (LC)	13
<i>Hoplobatrachus</i>	<i> rugulosus</i>	GD,GX,HK,HN	Least Concern (LC)	10
<i>Hyla</i>	<i> sanchiangensis</i>	GD,GX	Least Concern (LC)	10
<i>Philautus</i>	<i> odontotarsus</i>	GD,GX,HN	Least Concern (LC)	10
<i>Rana</i>	<i> adenopleura</i>	GD,GX,HN	Least Concern (LC)	10
<i>Rana</i>	<i> sangzhiensis</i>	GD, GX	Data Deficient (DD)	8
<i>Xenophrys</i>	<i> palpebralespinosa</i>	GD, GX	Least Concern (LC)	8
<i>Amolops</i>	<i> chunganensis</i>	GD, GX	Least Concern (LC)	5
<i>Bufo</i>	<i> melanostictus</i>	GD,GX,HK,HN	Least Concern (LC)	5
<i>Hyla</i>	<i> chinensis</i>	GD,GX	Least Concern (LC)	5
<i>Hyla</i>	<i> simplex</i>	GD,GX,HN	Least Concern (LC)	5
<i>Kalophrynus</i>	<i> interlineatus</i>	GD,GX,HK,HN	Least Concern (LC)	5
<i>Limnionectes</i>	<i> fujianensis</i>	GD,GX,HK	Least Concern (LC)	5
<i>Pachytriton</i>	<i> labiatus</i>	GD, GX	Least Concern (LC)	5
<i>Paramesotriton</i>	<i> chinensis</i>	GD, GX	Least Concern (LC)	5
<i>Rana</i>	<i> guentheri</i>	GD,GX,HK,HN	Least Concern (LC)	5
<i>Rana</i>	<i> macrodactyla</i>	GD,GX,HK,HN	Least Concern (LC)	5

Genus	Species	Distribution	IUCN Status	Priority score
<i>Rana</i>	<i>margaretae</i>	GD, GX	Least Concern (LC)	5
<i>Rana</i>	<i>schmackeri</i>	GD, GX	Least Concern (LC)	5
<i>Rana</i>	<i>taipehensis</i>	GD, GX, HK, HN	Least Concern (LC)	5
<i>Rana</i>	<i>versabilis</i>	GD, GX	Least Concern (LC)	5
<i>Rhacophorus</i>	<i>dennysi</i>	GD, GX	Least Concern (LC)	5
<i>Xenophrys</i>	<i>boettgeri</i>	GD, GX	Least Concern (LC)	5
<i>Philautus</i>	<i>rhododiscus</i>	GD, GX	Near Threatened (NT)	4
<i>Brachytarsophrys</i>	<i>carinensis</i>	GD, GX	Least Concern (LC)	3
<i>Kaloula</i>	<i>pulchra pulchra</i>	GD, GX, HK	Least Concern (LC)	3
<i>Fejervarya</i>	<i>limnocharis</i>	GD, GX, HK, HN	Least Concern (LC)	0
<i>Microhyla</i>	<i>butleri</i>	GD, GX, HK, HN	Least Concern (LC)	0
<i>Microhyla</i>	<i>heymonsi</i>	GD, GX, HN	Least Concern (LC)	0
<i>Microhyla</i>	<i>ornata</i>	GD, GX, HK, HN	Least Concern (LC)	0
<i>Microhyla</i>	<i>pulchra</i>	GD, GX, HK, HN	Least Concern (LC)	0
<i>Occidozyga</i>	<i>martensii</i>	GD, GX, HN	Least Concern (LC)	0
<i>Pachytriton</i>	<i>brevipes</i>	GD, GX	Least Concern (LC)	0
<i>Philautus</i>	<i>gracilipes</i>	GD, GX	Least Concern (LC)	0
<i>Polypedates</i>	<i>megacephalus</i>	GD, GX, HK, HN	Least Concern (LC)	0
<i>Polypedates</i>	<i>mutus</i>	GD, GX, HN	Least Concern (LC)	0
<i>Rana</i>	<i>latouchii</i>	GD, GX, HK	Least Concern (LC)	0
<i>Rana</i>	<i>nigrotympanica</i>	GD, GX, HN	Least Concern (LC)	0
<i>Rana</i>	<i>zhenhaiensis</i>	GD, GX	Least Concern (LC)	0
<i>Xenophrys</i>	<i>glandulosa</i>	GD, GX	Least Concern (LC)	0

We discussed appropriate future actions to take with regard to this list and one example was discussed. *Xenophrys brachykolos* was included in the top five species yet nothing is known about its breeding ecology. If a sudden and catastrophic decline were to occur in this species, little could be done to maintain or breed it in captivity. An example of appropriate actions to take, given this information, would be to engage concurrent studies of its reproductive ecology in the field and in a captive breeding facility. While this is only an example for one species, conservation action plans developed in the future for each species will recommend appropriate actions.

Discussion of Future Plans

Amphibian chytrid fungus (Batrachochytrium dendrobatidis)

Since *Philautus romeri* is a high priority for conservation, it would be useful to screen some populations for the amphibian chytrid fungus (hereafter Bd). Nancy Karraker can probably include this species in her ongoing monitoring for Bd in Hong Kong.

The Beijing Institute of Zoology was swabbing American bullfrogs for Bd and found it. They now plan to sample similar native ranid species. The original study in Yunnan will extend to Viet Nam but maybe not Guangdong. There is an established population of American bullfrogs as well as another species (red belly with smooth green back) introduced from the pet trade on Nanau Island in northern Guangdong. Nancy Karraker may be able to work with Dr. Gong to screen populations on this island. There are also established populations of American bullfrogs in two nature reserves in Guangdong. It would be helpful if these populations and those of native species could be tested for Bd.

In Hong Kong, AFCD reports that American bullfrogs have been seen in Wu Kau Tang and Kam Tin in the northeastern New Territories and also at Tai Tam on Hong Kong Island. The group from the University of Hong Kong will visit these sites in June, and July if necessary, to determine if the bullfrogs are breeding. If so attempts will be made to capture and euthanize as many tadpoles and adults as possible and to remove any egg masses observed.

Other efforts

An ecological study of *Cynops orphicus* should be of high priority.

AFCD has completed a simple action plan for *Paa spinosa* but will expand upon it. KFBBG has an existing internal action plan for *P. romeri*. Based on the existing plans, AFCD will prepare a detailed action plan for *Philautus romeri*. Simon Chan noted that when the detailed action plans were completed they would be distributed to the group for suggestions and comments. A primary goal for the group should be to develop conservation action plans for the top five priority species within the next three years.

Summary of future plans:

1. Expand screening efforts for Bd in native and non-native amphibians.
2. Identify information gaps and collect ecological data for top five priority species.
3. Develop conservation action plans for the top five species in the next three years.

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Prioritization Workshop for Amphibian Species in Hong Kong and Guangdong

22-23 May 2008

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