



CBSG News

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*Volume 8
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December 1997*

*Newsletter of the
Conservation Breeding
Specialist Group,
Species Survival
Commission,
World Conservation Union*

1997 CBSG Annual Meeting in Berlin

This issue of *CBSG News* contains the proceedings of the 1997 CBSG Annual Meeting in Berlin (some articles have been edited due to space restrictions). The meeting was productive and interesting and, as always, a great networking opportunity with 111 people from 23 countries participating. However, this year's meeting was, in one very important way, quite unusual. Our chairman, Dr. Ulie Seal, was unable to attend the meeting due to his wife's illness. Both Ulie and Marialice wanted very much to be with us in Berlin but neither regretted the decision not to attend. Marialice passes away on 20 September. With her passing, CBSG and the international conservation community have lost a great advocate, leader and friend. As her son said in his eulogy to her, "*Her death leaves a rent in the fabric of our lives, but as she is integral in the fabric of our individual selves and our lives, she will always be with us. She has given each of us a gift, cherish it, use it wisely and pass it on.*"

In spite of Ulie's absence, the CBSG Annual Meeting went smoothly and the responses from participants have been positive. This is, in large part, due to the strength of the CBSG community and the commitment of its members. CBSG is its members and this was clearly evident in Berlin. Thank you to all who participated.

Next year's Annual Meeting will be held 9 – 11 October in Yokohama, Japan. We hope you will be able to attend.

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12 December 1997

CBSG News

The *CBSG News* is published by the Conservation Breeding Specialist Group, Species Survival Commission, World Conservation Union. *CBSG News* is intended to inform CBSG members and other individuals and organizations concerned with the conservation of plants and animals of the activities of the CBSG in particular and the conservation community in general. We are interested in exchanging newsletters and receiving notices of your meetings. Contributions of \$25 (U.S.) to help defray the cost of publication would be most appreciated. Please send contributions or news items to:

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CBSG Mission Statement

The mission of the Conservation Breeding Specialist Group is the conservation or establishment of viable populations of threatened species.

The goals of the CBSG are to:

1. Organize a global network of people and resources.
2. Collect, analyze and distribute information.
3. Develop global conservation breeding programs.
4. Integrate management programs for captive and wild populations.



ARAZPA Regional Report



The Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) represents 37 zoological institutions and four associated institutions. ARAZPA administers:

- the *Animal Husbandry Program*, aimed at further developing taxon-specific husbandry expertise within the region, and
- the *Australasian Species Management Program*, which facilitates strategic collection management and intensive population management.

These programs are supported by a structure of Taxon Advisory Groups (TAGs) which foster a regional approach to collection planning, develop Captive Management Plans for the management of priority taxa, and prepare husbandry guidelines for problem taxa. In addition, ARAZPA Specialist Contacts facilitate communication amongst networks of zoo and aquarium specialists in the fields of veterinary medicine, records keeping, taxonomy, research, education, marketing, aquarium management and horticulture.

Partnership with Zoo Keeping Association

ARAZPA and the Australasian Society of Zoo Keeping (ASZK) formalized a partnership in 1997, combining their memberships to create a single industry voice in Australasia. This will combine the resources and activities of the two organizations and is expected to benefit both organizations through eliminating duplication of effort and strengthening communication throughout the region.

Animal Husbandry Program

An initial and significant outcome of this formal collaboration is the establishment of the *Animal Husbandry Program*. A committee of representatives from ARAZPA and the ASZK has been appointed to oversee the program, which will operate primarily through the existing network of TAGs. The aim of the program is to coordinate the provision of regional husbandry advice to ARAZPA institutions and to prioritize husbandry research efforts to reflect regional requirements.

Australasian Species Management Program

In Situ Conservation

ARAZPA institutions are currently involved with wildlife agency recovery programs for 28 taxa native to Australia and New Zealand. In 26 of these programs,

captive populations held in ARAZPA zoos are managed as an integral part of the recovery effort. Captive management for these species is directed either at reintroduction of captive-bred or captive-raised animals, or for research to assist with furthering recovery plan objectives. Programs for 12 species are currently releasing captive animals to the wild as part of an integrated recovery effort; programs for another seven species include plans for future release to the wild within the life of the program. Captive populations of a further three species are managed as part of wildlife agency recovery programs operating outside Australasia.

A Frog Working Group has been established by the Australian federal wildlife agency in response to increasing evidence of the widespread decline of amphibian populations in Australia. The group aims to link the amphibian conservation efforts of wildlife managers, researchers and zoos, and provides a significant forum for the Amphibian TAG.

Captive Management Plans

A total of 46 taxa are currently covered by an approved management plan, either as part of a wildlife agency recovery program, or as an ARAZPA Captive Management Plan.

Studbooks

Fifty-six regional and international studbooks are currently maintained in ARAZPA institutions. Six new regional studbooks were completed during the 1996/7 period, and data from all remaining 50 studbooks were updated. Two International Studbook Keeper positions were appointed to personnel from ARAZPA institutions during the 1996/7 period. The International Studbook covering tree kangaroo taxa (*Dendrolagus* spp.) will now be coordinated primarily from the National Museum in Papua New Guinea, and the International Studbook for the Silvery Gibbon (*Hylobates moloch*) will be managed jointly between ARAZPA and PKBSI representatives.

Taxon Advisory Groups

The 1997 Regional Census and Plan was produced, including details of TAG collection planning advice across all taxa, as well as a review of TAG activities and progress with priority programs.

ARAZPA TAGs are currently testing the use of discussion forums on the World Wide Web to enhance communication amongst a widely dispersed membership. ARAZPA is currently managing Web discussion forums for:

- Australian Passerine TAG
- Records Officers Group
- Monotreme and Marsupial TAG
- Carnivore TAG
- Perrisodactyl and Proboscoid TAG
- Elephant management issues

The Tree Kangaroo CAMP/PHVA, proposed by the Papua New Guinea Fauna TAG and planned for September 1997, was postponed due to lack of funds. ARAZPA is committed to pursuing further funding options for this project.

Collaboration with ISIS

ARAZPA continues to collaborate closely with ISIS, assisting with software design and development of international records keeping and studbook standards. ARAZPA staff are represented on the design team for the planned new generation of ISIS studbook management software, *Global Studbook System*, and are assisting with the re-design and development of the zoo records keeping system, *ARKS*. ISIS staff member Crispin Wilson spent four months on secondment to the ARAZPA office in early 1997.

Genome Resource Network of Australasia

ARAZPA is collaborating with the Cooperative Research Center for the Conservation and Management of Marsupials at Macquarie University, Sydney to establish a Genome Resource Network of Australasia (GRNA). This is a new initiative in this region, aiming to facilitate communication and collaboration among individuals and organizations with an interest in genome resource storage and research. The GRNA is intended to be an independent network coordinated by an advisory committee with members from a range of related fields and organizations. The inaugural meeting of the GRNA was held in Sydney on 1-2 August, and included representation from a range of wildlife agencies, research institutions, zoos, botanical gardens and CBSG.

NZ Conservation Management Group

The New Zealand Conservation Management Group is an incorporated body working to promote captive breeding in support of the conservation of New Zealand native fauna. The group conducted its 1997 conference at Rotorua in June, with the conference theme being hybridization. ARAZPA and CMAG are considering options for collaboration in recognition of the shared mission of the two organizations.

Training

- ARAZPA staff contributed a series of lectures as part of the final year program of a technical course in zookeeping offered by the Sydney Institute of Technology.
- ARAZPA has been invited to develop the population biology component of a graduate certificate course in Captive Animal Management, due to begin in mid-1998. The course will be offered by Charles Sturt University in N.S.W., Australia, and is intended to represent further professional educational opportunities for animal management personnel.
- Records keeping and population management training programs were run by ARAZPA staff in six ARAZPA institutions during the 1996/7 period.

Publications

- ARAZPA publications produced during the 1996/7 period include:
- 1997 Regional Census and Plan for ARAZPA zoos and aquariums;
 - Proceedings of the 1995 ARAZPA/ASZK annual conference;
 - Bi-monthly editions of the *ARAZPA Newsletter*, reporting news of regional developments and zoo and aquarium activities.

In addition, a total of 56 studbook data sets were submitted to ISIS for publication on the *ISIS Studbook Library CD ROM*.

New Address for World Wide Web Site

The ARAZPA web site, which contains a range of information on ARAZPA programs, is now accessed through a new address: www.worldzoo.org/arezpa

This web site includes a number of additional ARAZPA member services, including access to all ARAZPA studbook data sets and to a range of discussion forums which provide a new avenue for communication among members of Taxon Advisory Groups and specialist networks. ■

Submitted by Christine Hopkins, ARAZPA.



British Isles Regional Report



Organizational Changes

The Federation of Zoological Gardens of Great Britain and Ireland functions through committees comprising staff from member institutions. The activities of these committees are coordinated and supported by the Federation's permanent staff who are based at the Regent's Park Office. The last year has seen the following changes:

Peter Olney retired as Director of the Federation last August. He is continuing his work with the International Zoo Yearbook and retains his position as International Studbook Coordinator. Rosemary Potter retired as Administrative Secretary last October, but continues to assist with the Education Committee. Douglas Napier is the new Director, and Mimi Frame is now the Administrative Secretary. Caroline Lees, Conservation Coordinator, will be leaving the Federation in September. The Federation retains its Public Relations consultant, Mary Rosevear.

Support for the EAZA/EEP

The Federation is a member, and strongly supports the work, of the European Regional Association EAZA. During the past year, the Federation has assisted with the EEP Coordinators course, expanded its own database of *in situ* conservation involvement to include EAZA members, and assisted with the production of guidelines for European TAG Chairs.

Federation Committees

Conservation and Animal Management Committee

This committee has continued to set policy and to monitor and advise members on animal management and conservation activities. During the year the committee reviewed its policy on disposal of surplus stock, commented on legislation relating to the welfare of animals in transport, and maintained a watching brief over the implementation of the Balai Directive (concerning movement of animals between European countries) and Bovine Spongiform Encephalopathy in zoos. In addition the committee oversees the following Federation activities:

Joint Management of Species Committee (JMSC)

The British Isles forms part of the European region, and full participation in European programs is actively encouraged. The JMSC, through the British Isles TAG system, continues to support cooperative species management programs within the British Isles for native species, and for species which are not man-

aged at the European level. There are currently 23 active British Isles TAGs; six previously active ones now function at European level only. Neil Bemment took over from Miranda Stevenson as Chair of the Committee in February.

The Federation's annual training course for ISIS software was held in March, at Manchester Metropolitan University. Training covered ARKS 3.0, SPARKS 1.4 and REGASP.

A meeting was held in September to familiarize TAGs with some of the scientific techniques available for resolving specific species management problems. Topics covered included DNA profiling, the role of museums, assisted reproduction, contraception, genetic resource banking and population viability analysis.

Research Group

Research needs identified by the TAGs continue to be circulated to contacts in university departments, as a means of channeling students into priority areas for research. An enrichment manual is in production in collaboration with the Association of British Wild Animal Keepers. A survey of zoo facilities available for visiting researchers was carried out to assist placement schemes. Progress was made with the formation of an ethics committee. A British Isles representative was invited to join the EAZA Research Committee.

Plant Group

A new Federation Group has been formed under the umbrella of CAM to deal with plant-related issues. The first meeting will be held in September 1997. Topics to be addressed by the Group include: managing areas within zoos for browse/food production; establishing databases of plant species which have been used successfully in enclosures; linking with existing plant groups to facilitate access to wild source plant material and information on the composition of specific habitats to assist the development of habitat exhibits; using zoo areas to house rare plant collections; and identifying a suitable record keeping system.

Marketing and PR Committee

The focus of the committee in 1996 was "Tiger Week" - a week in May during which Federation members were asked to organize activities to raise awareness and funds for tiger conservation in the wild. The week was so successful that the campaign continued throughout the year, coordinated by the campaign working group and with financial assistance from ESSO UK. Of the over £70,000 raised, £27,000 was given to Global Tiger Patrol to fund the training and equipping of wildlife managers and vets, £20,000 was

given to Tusk Force who have established a fifth anti-poaching patrol in Siberia, and £15,000 was used to support the ongoing field research on tigers in Way Kambas National Park, Sumatra. Further payments will be made to Tusk Force and the Sumatran Tiger Project in Way Kambas. In addition, the campaign was hugely successful in drawing attention to, and fostering an understanding of, the problems facing the tiger, the reasons for its decline and the factors limiting its recovery.

"It's Your Wildlife...Save It!" is the title of the 1997-1998 campaign which is targeting British wildlife. The Federation has formed partnerships with the government wildlife conservation agencies for England, Scotland and Wales, and with the non-governmental Wildlife Trust. Several projects have been selected for financial support, a school pack has been prepared for distribution to 30,000 schools, and campaign collecting boxes and promotional tools have been circulated. One important aspect of this program is the formation of formal links at national level which are helping to establish dynamic partnerships between *in situ* and *ex situ* conservation organizations at a local level.

Education Committee

Steve McKeown took over from Peter Stevens as Chair of the Committee. The 1996 Annual Conference of British Zoo Educators took place 14-16 November at Whipsnade Wild Animal Park. Progress is continuing with the revision of the City and Guilds Zoo Animal Management Course which is available to zoo staff worldwide.

Membership and Licensing Committee

Miranda Stevenson succeeded Ken Simms as Chair of the Committee. The Federation currently has 61 member collections and 50 Associates. This committee continues to help in maintaining the high standards expected of its members and in monitoring, advising and assisting with the implementation of the Zoo Licensing Act.

In 1996 the Federation conducted a survey to ascertain which of its many activities the members considered to be of the most use and the highest priority. The results of this survey are helping to shape the present strategic development of the organization. One way that the M&L Committee intends to contribute to this important work is by the production of promotional material stating the work and goals of the organization and promoting the benefits of membership. This work would be greatly facilitated by a benchmarking exercise with other regional organiza-

tions. The committee thus intends to contact several other regional organizations asking them for details of the services they provide to members, and their members' perception of the relative importance of these services. We would therefore be grateful to hear from others on the subject.

Publications and Reports

The Federation published an addition to its husbandry guidelines series entitled *Management Guidelines for the Welfare of Zoo Animals: Wildcat, Felis sylvestris* (Lyons, 1996). The JMSP Annual Report 1996 detailing the contributions made by the British Isles to species management initiatives was produced and circulated regionally and internationally. Seven-column inventories of birds and mammals held in Member (and selected other) collections were also published and circulated regionally and internationally, as were the proceedings of the JMSP meeting held in September entitled *Uses of Biotechnology in Species Management*. ■

Submitted by Caroline Lees, London Zoo.

EAZA Regional Report

The EAZA Council, chaired by Roger Wheeler (Edinburgh Zoo), met at Planckendael Zoo, Belgium on 19-20 April. Productive sessions of the Education and Exhibit Committee, the Legislation Committee and the Working Group on Support to Central/Eastern European Zoos were held the first day.

Important items discussed at the Education and Exhibit Committee meeting included a proposal for Education Standards for EAZA Zoos to be presented to the members at the AGM in October and the initiation of a questionnaire amongst EAZA members to survey their current efforts regarding education, interpretation and exhibit design. The members of the committee were very pleased with the magazine *EAZA News* and discussed possibilities to increase its distribution amongst staff in EAZA institutions. It was also suggested that *EAZA News* would serve as an excellent PR tool, and should consequently be distributed amongst national and local politicians, NGOs, media and interested zoo visitors.

The working group on Support to Central/Eastern European Zoos plans to send an EAZA delegation to Romania to assist the Galati Zoo with masterplanning and the establishment of a new zoo in June 1997. The Mayor of Bursa attended the early spring IUDZG marketing meeting in Aalborg and consequently invited Miklos Persanyi (Budapest Zoo), Jens Lilleor (Aalborg Zoo) and Koen Brouwer (WAZA) to Turkey for a masterplanning session. EAZA has subsequently been asked to assist the city of Bursa with plans to develop a new zoo. Earlier in the year, EAZA was also involved in a CBSG-supervised masterplanning program at the Rome Zoo, Italy.

The Legislation Committee has provided important advice to the EAZA Council over past years. Chairman Ulrich Schürer (Wuppertal Zoo) was assisted at the April meeting by Enric Mas, who is serving as a special advisor to EAZA in legal affairs. The most important legislative issues dealt with in Planckendael included the new European CITES Regulation that will become effective by 1 June 1997. A draft document on the implementation of the CITES Regulation, which has great relevance to zoos, has been published by the European community.

The EAZA Legislation and Ethics Committee met in an early morning session on 20 April. Several zoos and related organizations were proposed and later accepted by the Council for full, temporary or associate membership of EAZA. EAZA membership now includes 204 full members, 22 associate members and 13 temporary members in 28 countries. Other issues considered by the Committee included the draft Code of Ethics, and the possibility of including a new category of EAZA membership for zoos that are in the planning stage or under construction and not yet open to the public. The Membership Committee will prepare a proposal for further discussion at the next Council meeting in October 1997.

The EEP Committee of EAZA, chaired by Dieter Jauch (Suttgart Zoo), met in Amsterdam on 21 July 1997 and approved a further eight EEP programs and European studbooks. Two new TAGs were also proposed – a Galliformes TAG and a Turaco and Toucan TAG, bringing the total number of TAGs in Europe to 27. The new policy on EEP participation by non-EAZA institutions was evaluated, and several avian EEPs were provided with a general exemption to the new and quite strict rules, to ensure the continued functioning of the European breeding programs.

All mammalian and avian taxa have now been surveyed in the leading European zoos by the EAZA Office over the past three years as an essential part of European collection planning. These surveys are still

necessary, and will be continued, as over 50% of the European zoos participating in breeding program activities are not members of ISIS.

The EAZA Research Committee, chaired by Gunther Nogge, met at Cologne Zoo on 5 December 1996. A questionnaire to identify research needs in various taxa kept by zoos was prepared by the Research Committee. In the meantime, this questionnaire has been sent out to all EEP TAG Chairs. Presentation of the results is planned at the EAZA AGM in October 1997. Additionally, a position paper on research and a proposal for zoo/university research protocols were finalized by the Committee. These important documents have been submitted for approval to the EAZA Council. Finally, an EAZA University and Zoo Expert database has been compiled by committee member Angela Glatston (Rotterdam Zoo), and have been made available to all EAZA members.

The EAZA Veterinary Committee met in Zurich on 7 May 1997, just prior to the 38th International Symposium on Diseases in Zoo and Wild Animals. It was the first meeting under the chairmanship of Alex Rübel, Director of Zurich Zoo. The Balai Directive (92/65/EC) continues to cause EAZA concern. A number of problems have arisen due to the implementation of this directive, one of them being a ban on the transfer of primates between (Balai) approved and non-approved zoos. EU member states have chosen different strategies with regard to the implementation of this directive – there have been no clear guidelines from Brussels on a standard approval strategy. Additionally, the directive does not specify how to deal with animals imported from zoos in the so-called third countries, that do not belong to the EU, nor does the directive offer a solution for animals imported from the wild. For primates, it also works the other way around: reintroductions of primates would be impossible under the Balai, as the wild could never be approved. Fortunately, Brussels informed EAZA that the directive does provide a certain degree of flexibility for zoo animals, although this has not been worded very succinctly. The EAZA Veterinary Committee's goals with regard to the Balai must be to establish a uniform interpretation of accreditation specifically for zoos, and to establish a procedure to exchange animals (primates primarily) between approved and non-approved (e.g. third country) zoos. ■

Submitted by Koen Brouwer, EAZA.

JAZGA Regional Report



Meetings

The 9th Annual Meeting and Workshop of SSCJ was held in Chiba City on 12 - 13 September 1996 in the presence of H. H. Prince Fumihito Akishino, the President of JAZGA. The meeting was attended by 202 persons from 107 institutions.

The 6th Annual Workshop of Elephant Subject (security and breeding) under control of SSCJ was held at the Adventure World, Shirahama, Wakayama on 15-16 October 1996, and was attended by 73 persons from 40 institutions.

Reorganization

SSCJ reorganized its propagation groups and regional studbook keepers as mentioned below, and added the Technical Group for promoting artificial breeding, gene banks, use of transponders, and similar issues.

Species for Propagation

Marsupials: Koala

Apes: Gorilla, orangutan, chimpanzee

Monkeys: Lion-tailed macaque, Francos' leaf-monkey, mandrill

Prosimians: Black lemur, ruffed lemur

Bears: Giant panda

Big cats: Amur tiger, Bengal tiger, Sumatran tiger, Amur leopard, Persian leopard, snow leopard, cheetah

Small carnivores: Red panda

Otters: Sea otter, otters (all species)

Pinnipeds: Steller's sea lion, harbor seal, large seal, Otaria, California sea lion

Dolphins: Bottle-nosed dolphin, finless porpoise

Perissodactyles: Black rhinoceros, white rhinoceros, Malayan tapir, Brazilian tapir, Grevy's zebra

Artiodactyles: Japanese serow

Elephants: Asian elephant

Eagles and owls: Great condor, white-tailed sea-eagle, Steler's sea-eagle, Blakiston's fish owl, Japanese golden eagle, Japanese eagle owl

Penguins: Humboldt penguin

Storks: Oriental white stork, waldrapp

Cranes: Red-crowned crane, white-napped crane, hooded crane, great white crane, wattled crane, Stanley crane, crowned crane, Edwards' pheasant

Small birds: Salmon-crested cockatoo, scarlet macaw, hyacinth macaw, crowned pigeon, blue-crowned pigeon, maroon-breasted crowned pigeon, Victoria crowned pigeon, great Indian hornbill, Rothschild's mynah

Amphibians: Japanese giant salamander

Japanese fish: Miyakotanago, hariyo, nippon-baratanago, itasenpara, suigen-zenitanago, hinamoroko, usimotsugo, ayumodoki, nekogigi, Musashi tomiyo, zenitanago, tanagomodoki, sinaimotsugo, akame

Foreign fish: Asian arowana, arapaima, Australian lung-fish

Species for Registration

Edentates: Giant anteater

Apes: Concolor gibbon, capped gibbon, wawwaw gibbon

Monkeys: Diana monkey, drill

Prosimians: Potto, Lemuridae (each sp.), pygmy marmoset, cotton-top tamarin, emperor tamarin, lion tamarin, Goeldy's monkey

Bears: Polar bear, spectacled bear, sloth bear, Malayan sun bear, Kodiak bear

Small carnivores: Tsushima wild cat

Perissodactyles: Indian rhinoceros, Baird's tapir, mountain zebra

Artiodactyles: Scimitar oryx

Elephants: African elephant

Eagles and owls: Japanese hawk eagle

Penguins: Cape penguin, Magellanic penguin, rock-hopper penguin, macaroni penguin, gentoo penguin, king penguin

Small birds: White cockatoo, Goffin's cockatoo, Buffon' macaw, military macaw, rhinoceros hornbill, Malabar pied hornbill, red-billed hornbill

Future Conferences

The 1998 CBSG Annual Meeting will be held in Yokohama on 9-11 October 1998. The next SSJC Conference will be held in Hamamatsu, Shizuoka Prefecture on 21-22 October 1997. ■

Submitted by JAZGA.

*Join us in Yokohama, Japan for
the 1998 CBSG Annual Meeting
9 - 11 October 1998*

See you there!



CAZG Regional Report



Overview

The membership of the Chinese Association of Zoological Gardens (CAZG) is currently at 181 institutions. Shanghai Wildlife Park, Qinhuangdao Wildlife Park, Yunnan Wildlife Rescue Center and seven other parks have become new institution members in the last two years. The association has six regional branches: North China branch, Northeast branch, East China branch, Central South branch, Southwest branch and Northwest branch.

The CAZG secretariat has set up a department of endangered species that is responsible for the establishment of endangered species studbooks and developing endangered species conservation programs. The giant panda breeding committee, the South China tiger conservation coordination committee and the crane conservation coordination committee have been established under CAZG.

The South China tiger conservation coordination committee held an annual meeting in 1996. The committee reviewed and summarized the progress since its establishment. The studbook was updated and the draft document of South China captive management standards was revised according to requirement of the committee's five-year plan.

A training course on crane husbandry and artificial insemination techniques was held by the crane committee last March. Thirty-five people from different zoos participated in the course.

The giant panda breeding committee held a workshop on giant panda captive management planning in collaboration with CBSG last December. This workshop was sponsored by CAZG, Columbus Zoological Gardens and the AZA Giant Panda Program. Dr. Seal led a group of specialists to China who contributed much of their efforts to the development of a giant panda captive management plan. This plan will play an active enhancement role in giant panda breeding and conservation.

The department of endangered species conservation assisted the above three committees with coordination of their respective breeding program. It updated the International Giant Panda Studbook, South China Tiger Regional Studbook, and the East white stork and red-crowned crane regionally.

Future Plans

Another international symposium on giant pandas and other endangered species will be held in Chengdu on 24-29 September 1997. The focus will be on giant

panda and other endangered species conservation. It will help Chinese zoos to improve their husbandry, breeding and research techniques. CBSG and other foreign colleagues will be invited to attend the symposium.

We will determine the list of species with priority to develop additional conservation plans. Studbooks of these species will be established in preparation for these programs. We hope to continue involvement and communication with international organizations and to pursue more international cooperative projects. ■

Submitted by Zhao Qingguo, CAZG.

AMAZOO Regional Report

During this year the Mesoamerican and Caribbean Zoo and Aquariums Association with the collaboration of CBSG facilitated the following activities:

Costa Rica

Confiscation Analysis and Planning Workshop

This workshop was held 1-3 October 1996 at Zoológico Nacional Simón Bolívar, San José, Costa Rica. It was organized by Fundación pro Zoológicos, SINAC-MINAE, Universidad Nacional in collaboration with CBSG and was supported by FUNDAZOO and Instituto Costarricense de Turismo. The processes and problems of confiscated flora and fauna were analyzed by 51 participants from different governmental and private institutions. The principal recommendations were:

- Elaborate a database to register confiscations, rescue centers, breeding facilities, nurseries and research centers.
- Evaluate the rescue centers and control them.
- Train SINAC-MINAE and NGO staff in the biology of the species and management of confiscated species in captivity and during transportation.
- Promote environmental education workshops to the communities living adjacent to national parks to avoid the extraction of flora and fauna.

Recommendations accomplished include:

- Costa Rican Environmental and Mines Ministry completed the first evaluation of the existing rescue centers.

- FUNDAZOO is developing a training program for SINAC staff to be initiated next September.

Threatened Plants of Costa Rica CAMP

This workshop was held 4-6 October 1996 at Zoológico Nacional Simón Bolívar, San José, Costa Rica. It was organized by FUNDAZOO, INBio, Universidad Nacional, Herbario Nacional (Museo Nacional) in collaboration with CBSG and was supported by Instituto Costarricense de Turismo. During this workshop the threatened status of 41 plants of Costa Rica was evaluated. More than 22 people representing 12 different institutions shared their knowledge for assessment of the status of each species and its habitat in the wild. Methods of cultivation of some of the most endangered taxa were discussed. Several participants also indicated the general location of known stands of each species on a map. Eleven species were classified as Critical (27%), 15 as Endangered (36%) and 6 as Vulnerable (15%) for a total of 32 of 41 species classified as threatened (78%). Most of the species classified as Critical or Endangered now exist in only one to five small populations. Conservation action recommendations were made. As a result of this workshop, the Ministry of Environment and Energy decreed a total protection of the species.

Cuba

Selected Cuban Species CAMP II

This workshop was held 7-10 March 1997 at La Habana Zoo, La Habana, Cuba. It was organized by La Habana Zoo; Biology Faculty, La Habana University; Natural Sciences Museum; Flora and Fauna Direction, Agriculture Ministry; National Zoo in collaboration with CBSG, and was supported by Cuban Foreign Affairs Ministry. The threatened status of 15 Cuban taxa was evaluated during the CAMP workshop by 45 participants representing eight Cuban institutions. Conservation recommendations were outlined for these species. The participants also recommended that the CAMP process be continued in Cuba. Arrangements have been made with CBSG as a collaborator to lead other CAMPs in April 1998, continuing this evaluation of the condition of Cuban endemic species and subspecies. In addition, it was proposed that a PHVA be organized with CBSG for the almiquí (*Solenodon*) for the same date [see *CBSG News* 8(1)].

Conservation Analysis of La Habana Zoo Workshop

Held at La Habana Zoo, La Habana, Cuba on 11-13 March 1997, this workshop was organized by La

Habana Zoo, with the participation of its staff in collaboration with CBSG, and was supported by Cuban Foreign Affairs Ministry. During this workshop the analysis of La Habana Zoo in terms of conservation was initiated as a basis for its Master Plan. This exercise will to be continued next April 1998.

El Salvador

Confiscation Analysis and Planning Workshop

This workshop was held 2-7 June 1997 at the National Museum of Natural History, San Salvador, El Salvador and was organized by Zoological Foundation of El Salvador (FUNZEL) and National Parks and Wildlife Service (PANAVIS) in collaboration with CBSG. Thirty-five participants representing 20 different governmental and non-governmental institutions participated in the analysis of 22 species of wildlife fauna which are susceptible to illegal commercialization and confiscation. Also discussed were the problems and limitations in managing wild and rehabilitated fauna, including biological, institutional, legal and education concerns.

Regional Workshops

Regional Plan for the Management and Conservation of Mesoamerican Felids

This project was held at Zoológico Nacional Simón Bolívar, San José, Costa Rica on 7-12 April and 30 June - 2 July 1997. It was organized by the Mesoamerican and Caribbean Zoo Association; NOAHS Center; FUNDAZOO; Universidad Nacional; and AZA Felid TAG in collaboration with CBSG, and supported by U.S. Fish and Wildlife Service, Oklahoma City Zoo, Columbus Zoo, San Diego Zoo, Fort Worth Zoo.

The participants included 80 felid specialists representing nine countries in the region, including Panama, Mexico, Nicaragua, El Salvador, Belize, Guatemala, Cuba, Mexico and the Dominican Republic. Two CBSG facilitators and specialists from U.S. zoos, government agencies and other organizations also participated, providing expertise and sharing information and technology.

The first part of the workshop was a CAMP exercise to evaluate the situation of the five species of felines present in the region. After this, the problems affecting Mesoamerican felines were analyzed, along with possible actions and strategies to address these issues. These actions and strategies were divided into four groups: Wild Populations, Captive Management, Veterinary Management and Environmental Education. These are now considered the action priorities of the Association [see *CBSG News* 8(1)].

Regional Plan for the Conservation and Management of Mesoamerican Primates

This workshop was held 23-29 June 1997 at Zoológico Nacional Simón Bolívar, San José, Costa Rica. It was organized by IUCN/SSC Primate Specialist Group, Neotropical Section, AZA New World Primate Taxon Advisory Group, AZA Mesoamerican Fauna Interest Group, Asociación Mesoamericana y del Caribe de Zoológicos, Universidad Nacional (Costa Rica), Fundación pro Zoológicos, Brookfield Zoo, Houston Zoo, Burnet Park Zoo in collaboration with CBSG, and was sponsored by IUDZG/World Zoo Organization, St. Louis Zoo, New World Taxon Advisory Group.

Sixty-three participants from 28 institutions analyzed the conservation problems of Mesoamerican primates. A CAMP process guided the evaluation of the status of the primate species and subspecies present in each country. The participants recommended the conservation actions to be taken immediately and in the long-term to contribute to the conservation of this taxon. ■

Submitted by Yolanda Matamoros, AMAZOO.

AZA Regional Report



Program Overview

The American Zoo and Aquarium Association (AZA) represents 182 North American zoological institutions and over 7,000 zoo and aquarium professionals. The new AZA Long-Range Plan identifies wildlife and habitat conservation as among AZA's highest priorities. Many cooperative programs have been developed to help reach this goal, including Studbooks/Population Management Plans (PMPs) and Species Survival Plans (SSPs) for single species management and conservation, Taxon Advisory Groups (TAGs) for regional collection planning, Fauna Interest Groups (FIGs) for organizing field conservation and international training initiatives, and Scientific Advisory Groups (SAGs) to provide technical advice. Conservation education initiatives also support the members' goals in conservation and science. AZA currently has 82 SSPs covering 134 species, 44 TAGs, 11 FIGs and 10 SAGs. In addition, AZA institutions manage nearly 300 regional and international studbooks.

AZA Long-Range Plan

Adopted in 1996, the AZA Long-Range Plan (Key Result Areas III and V) outlines the AZA's fundamental objectives in conservation and science (C&S) and conservation education (CE).

The primary C&S objectives are to manage collections scientifically and cooperatively; link institutional conservation and science programs and range country programs; address ethical issues related to animal care, management and research; use collaborative AZA conservation funds to expand fund-raising capabilities; and utilize species and habitat conservation programs as a basis for conservation education programs.

The primary CE objectives are to compile and disseminate data relevant to AZA's education interests; identify, facilitate and promote education programs for AZA institutions; enhance professional development of AZA members; and liaise with non-AZA organizations to promote cooperation and an education message.

The following represent some of the activities completed during 1996-97:

Population Management/SSPs

- *ISIS Workshop on Studbook and Population Management Software Development.* AZA C&S staff (K. Willis) participated in an IMS-funded ISIS workshop in December 1996 to initiate development of the new generation of population management software. A software prototype is in development.
- *SSP Program Planning.* The AZA C&S Office was closely involved with SSP-related planning by the AZA's WCMC. Changes in program structure and protocols are proposed which will increase accountability and responsiveness while also increasing assistance to SSP Coordinators.

Strategic Collection Planning/TAGs

- *TAG Planning.* The AZA C&S Office participated in WCMC planning sessions designed to improve the Regional Collection Planning process, including evaluation criteria. TAGs are likely to take on more responsibilities for SSP and studbook coordination.

Fund-Raising to Support Conservation

- *1996 AZA Conservation Education Fund.* A total of 59 proposals were submitted for the \$350,000 of available funds (\$250,000 from the CEF and \$100,000 from the Disney Wildlife Conservation Fund). Of these, 23 projects were funded, ranging from field studies of poison arrow frogs in Surinam to the development of a new canine distemper vaccine.

- *1996 Ralston Purina Big Cat Survival Fund.* Fourteen proposals were submitted for the \$40,000 of available funds from the Ralston Purina Company. Three projects were funded, including the production of a husbandry manual for small felids and support of cheetah conservation in Namibia.
- *1997 AZA Conservation Endowment Fund.* Fifty-two proposals have been received for consideration of the \$200,000 available in endowment (CEF) and non-endowment (Disney) funds.

Conservation Education

- *Conservation Education Department.* A new director and full-time program assistant will be hired for the CE Department, which will liaison more closely with the C&S Office.
- *AZA Web Site.* The AZA web site (www.aza.org) is currently receiving about 260 hits per day, for a total of 7,800 per month and 93,600 per year.
- *Coral Reef Projects.* The AZA CE Department distributed a Coral Reef Resource Kit to all AZA institutions for use in International Year of the Reef educational outreach programs. AZA also sponsored a national "Save the Reef Poster Contest" in April 1997, drawing over 5,000 entries from 37 AZA institutions. With support from Disney, AZA developed a Public Service Announcement on behalf of coral reef conservation which has been viewed in 18 U.S. cities and reached an estimated 42 million viewers.
- *Exxon Tiger Traveling Exhibit.* AZA received \$150,000 from the Save the Tiger Fund (through Exxon Corporation and the National Fish and Wildlife Foundation) to develop a traveling exhibit focusing on the plight of the endangered tiger. This exhibit will tour selected AZA institutions over the next three years.
- *Suitcase for Survival.* Support from American Tourister revitalized this cooperative educational initiative between AZA, WWF and USFWS. Suitcases filled with products made from endangered species are circulated to AZA member institutions to educate people on the devastating effects of commercial trade of wildlife products.
- *AZA Conservation Education Course.* A Conservation Education Course has been added to the AZA Schools for Professional Development and will enable zoo educators to strengthen their skills and learn new approaches in conservation education.
- *Munsen Aquatic Conservation Exhibitory Award.* The Curtis and Edith Munsen foundation, in cooperation with AZA, has established this award to "recognize excellence in aquatic exhibits that have conservation education incorporated in the design and

presentation." Two \$25,000 prizes will be awarded annually to AZA institutions.

Training and Technology Transfer

- *Brazilian Training Workshop.* A training workshop on animal record-keeping and studbook maintenance was held in Brasilia from 12-16 May 1997. Sponsors were the AZA C&S Office (through the Disney Wildlife Conservation Fund), AZA Brazil FIG, IBAMA and Brazilian Zoo Association. Eighteen individuals were trained from Brazilian zoos and universities.
- *International Zoo Biology Training Courses.* The AZA Southeast Asia and Brazil FIGs received CEF grants to conduct zoo biology training courses in Myanmar and Brazil, respectively. The AZA Venezuela and Meso-American FIGS received IUDZG-WZO grants to support cooperative zoo biology training workshops.

Field Conservation/Fauna Interest Groups

- *FIG Chair Meeting.* A meeting of AZA FIG Chairs was held in Bethesda, MD from 24-25 January 1997 to address common concerns and to review various approaches to zoo- and aquarium-based *in situ* conservation and international training initiatives.
- *Field Conservation Resource Guide.* AZA C&S Office staff are working to produce and edit the *AZA Field Conservation Resource Guide*, which is tentatively scheduled for completion early in 1998.
- *AZA North American FIG.* The AZA North American FIG (NAFIG) has been approved and will be co-chaired by E. Diebold (Riverbanks Zoo), M. Wallace (Los Angeles Zoo), W. Waddell (Point Defiance Zoo), D. Warmolts (Columbus Zoo) and M. Hutchins (AZA). The initial organizational meeting was held in April.
- *AZA Venezuela FIG.* An AZA Venezuela FIG has been approved and will be co-chaired by P. McDaniel (Cleveland Zoological Society) and H. Quinn (Cleveland Zoo).
- *AZA Coral Reef FIG.* A proposal is being developed to establish an AZA Coral Reef FIG to facilitate cooperative efforts of AZA member institutions in coral reef conservation.

Partnerships

- *AZA-USFWS MOU.* The AZA C&S Office and NAFIG are working collaboratively with the USFWS to develop a Memorandum of Understanding (MOU) to increase collaboration between AZA institutions and FWS endangered species recovery plans.

- *Cooperative Conservation Projects Survey.* The AZA C&S Office, NAFIG and USFWS conducted a joint survey of AZA institutions to document collaborative projects and holding of North American wildlife.
- *Gilman Foundation Meeting.* The Howard Gilman Foundation and White Oak Conservation Center will host a meeting in March 1998 to review past collaboration between AZA institutions and USFWS on endangered species recovery and to identify methods for strengthening and expanding these partnerships.
- *Alliance for Aquatic Conservation.* The AZA and its Freshwater Fish Advisory Group signed a MOU with several U.S. government agencies to form a cooperative group known as the Alliance for Aquatic Conservation (ACONS). A "wish list" of 38 projects has been compiled and circulated, a directory of interested AZA institutions has been generated, and a section of the AZA web site will focus on aquatic conservation.
- *World Conservation Congress.* AZA C&S Office staff (M. Hutchins) participated in the IUCN Triennial World Conservation Congress in Montreal, Canada from 10-16 October 1996. Assistance was provided to Granby Zoo in developing a special exhibition at the conference on "Zoos and Conservation."
- *AZA/CES MOU.* To strengthen their relationship, an MOU was signed between AZA and the Center for Ecosystem Survival (CES). CES has generated funds for conservation by placing parking meters in AZA institutions for years. In collaboration with the Nature Conservancy, CES has raised over one million dollars for the purchase of park lands in Central America and has now begun an "Adopt-a-Reef" program.

Science/Scientific Advisory Groups

- *Institutional Data Management Group.* An Institutional Data Management Advisory Group (IDMAG) was formed to provide a forum for discussion of issues related to animal record-keeping and information management. A Registrar's Course is also being planned for the AZA Schools for Professional Development.
- *AOU Symposium on Avian Conservation.* AZA C&S staff participated in a symposium on "the evolving role of zoos and aquariums in avian conservation and science" at the 1996 Annual Conference of the American Ornithological Union (AOU) from 15-17 August in Boise, ID.
- *Primate Conservation Publication.* The American Society of Primatologists (ASP) has published the proceedings of a joint ASP/AZA symposium entitled *Primate Conservation: The Role of Zoological Parks.*

Conservation Planning

- *Black-Footed Ferret Recovery Analysis.* The AZA C&S Office received a \$35,000 grant from the National Fish and Wildlife Foundation (NFWF) to undertake a comprehensive review of the Black-Footed Ferret Recovery Program. The review was completed in August 1996 and will provide the basis for revision of the FWS Recovery Plan.
- *Micronesian Kingfisher SSP Action Plan.* The AZA C&S Office and Micronesian Kingfisher SSP were funded by NFWF and American Bird Conservancy to complete a program review and action plan. This plan was completed in December 1996 and was adopted by Pacific Islands Endangered Species Recovery Team.

Ethical Issues

- *Great Ape Ethics Conference.* AZA C&S staff (M. Hutchins) participated in the development of a workshop on ethical issues facing the captive management and conservation of great apes being organized by B. Beck (National Zoo) and T. Stoinski (Zoo Atlanta and Georgia Institute of Technology).
- *Environmental Enrichment Fund.* A cooperative AZA/ASPCA/AAZK Environmental Enrichment Fund has been approved to provide matching funds to support small-scale environmental enrichment projects at AZA institutions.

Publications

- *Endangered Species Update.* The AZA C&S Office continues to work with *Endangered Species Update*, which now includes news items and articles on activities of North American zoos. This provides an excellent forum to educate our colleagues in federal and state wildlife agencies and conservation organizations regarding the role of zoos and aquariums in endangered species conservation.

Public Relations

- *Life Magazine.* A cover story on the AZA's Species Survival Plan appeared in the March 1997 issue of *Life Magazine*, which highlighted breeding and field conservation programs for endangered species.

Administration

- *Staff Changes.* Robert Wiese left the AZA C&S Office in October 1996 to join the Fort Worth Zoo, and Kevin Willis left in July 1997 to join the Minnesota Zoo. Nationwide searches are underway to fill the positions. ■

Submitted by Michael Hutchins, AZA.

PAAZAB Regional Report

During June 1996 a special meeting of the African Preservation Programme (APP) Committee was convened to re-edit and update the APP Charter. After additional minor revisions, the new APP Charter II was ratified by the Council at the May 1997 PAAZAB Meeting. At the APP committee meeting, an amended Memorandum of Participation was produced and accepted and will now be used by all species coordinators (contact John Spence, Tygerberg Zoopark, for a copy of the APP Charter II).

The APP categories have been updated and renamed (see Table 1 for APP species categorization):

Cooperative Conservation Management APP. In this category, species management comprises *in situ* and *ex situ* management, and should be a cooperative effort between the APP-PG and relevant wildlife agencies. A Memorandum of Agreement (MOA) must be signed by the agencies concerned. Titles of animals in this category are relinquished. A masterplan, studbook and husbandry manual must be formulated and maintained, and a complete population management program initiated, under the guidance of an APP-SC.

Managed APP. In this category, a complete captive population management program must be initiated by the APP-SC. An APP Propagation Group must be established, and a masterplan, studbook and husbandry manual must be formulated and maintained.

Monitored APP. In this category, a regional studbook must be formulated and maintained. The studbook keeper is required to analyze captive population trends and include husbandry information in the studbook.

Censused APP. In this category, a studbook must be maintained by an appointed studbook keeper.

From 25-27 November 1996 a SPARKS training course was convened by PAAZAB at the National Zoo in Pretoria. This course was coordinated by Sarah Christie, London Zoo, and was made possible through the generous hospitality of the National Zoo.

During January 1997 Paul Hart resigned as the APP Secretary and as Species Coordinator for the Cape Brysbok (*Raphicerus melanotis*). The new APP Secretary is Dave Morgan, and Philip Cronje at Johannesburg Zoo has been accepted as the new Grysbok Species Coordinator. PAAZAB is presently in the fortunate position of having only one Species

Coordinator vacancy (for the riverine rabbit, *Bunolagus monticularis*). Our Species Coordinators are slowly but surely making good progress with the able assistance of the TAG Coordinators.

A serious setback occurred with the geometric tortoise (*Psammobates geometricus*) APP when 10 (5.5) specimens were stolen from the breeding pens at Tygerberg Zoopark. Two of these females were confirmed to be gravid. The remaining group consists of two females and three juveniles. Tygerberg Zoopark has approached the Cape Department of Nature and Environmental Conservation requesting replacement tortoises. It is suspected by law enforcement agencies that the stolen tortoises were smuggled to Europe.

Studbooks are progressing well. Of seven mammal APPs there are now four studbooks, birds have three studbooks out of seven APPs, and reptiles have four studbooks out of eight APPs. An increase in these numbers is expected by next year. ■

Submitted by John Spence, PAAZAB.

Table 1. Classification for APP species.

<u>Mammals</u>	
African wild dog	Managed
Riverine rabbit	Censused
Suni	Monitored
Cheetah	Managed
Black lemur	Monitored
Cape grysbok	Managed
African wild cat	Monitored
<u>Birds</u>	
Cape vulture	Managed
Cape parrot	Monitored
Southern ground hornbill	Monitored
Blue crane	Monitored
Southern bald ibis	Monitored
African pygmy goose	Censused
African penguin	Censused
<u>Reptiles/Amphibians</u>	
Cape platanna	Censused
Geometric tortoise	Monitored
Sungazer	Monitored
African rock python	Monitored
Dwarf crocodile	Monitored
Radiated tortoise	Managed
Madagascan ground boa	Monitored
Dwarf python	Censused

India Regional Report



Improvement of Zoos

Improved upkeep and welfare of animals in zoos continued to be the priority of the Central Zoo Authority. A sum of Rs. 25 million was made available to zoos for converting caged enclosures to moated enclosures. Elephants kept chained in zoos have been a subject matter of criticism by the animal welfare lobby. The Central Zoo Authority provided about Rs 4 million to Alipore Zoo Calcutta and Veermata Jijabai Udyan Zoo, Mumbai for construction of open-moated enclosures for elephants.

The concern for animal welfare in India has increased significantly. People for Animals (PFA) are monitoring the activities of all zoos and highlighting the inadequacies of zoos from time to time. The Central Zoo Authority follows up with concerned zoos.

International Union of Zoo Directors (IUDZG) has emphasized that substandard zoos seriously affect the image of the entire zoo community. With this objective in mind the Central Zoo Authority has ordered closure of 23 mobile zoos and 30 mini zoos, which could not provide satisfactory animal conditions.

Veterinary facilities have been significantly upgraded and new hospitals constructed at Nehru Zoological Park, Hyderabad and Sri. Chamarajendra Zoological Park, Mysore. Construction of hospitals is also underway at Mahatma Gandhi Zoo, Gwalior and Trivandrum Zoo.

Training Programs and Workshops

A 15-day course for zoo directors was organized at Bhubaneswar during December 1996. A two-week course was organized for keepers at Kanpur during January 1997. In-house courses for training of keepers were also organized by Assam State Zoo, Guwahati and Arignar Anna Zoo, Vandalur, Chennai.

Mamta Sharma, Kanpur Zoo, Uttar Pradesh, and Dr. N. Pannerselvam, National Zoological Park in Delhi, were deputed for a short course on conservation of endangered species at the summer school of Jersey Wildlife Preservation Trust, UK.

An annual workshop of zoo directors from all major zoos of India was organized during November 1996, with a focus on priorities for improvement of zoos. The zoo directors resolved to actively participate in planned breeding of indigenous endangered species. This includes the development of a detailed management plan, clearly outlining the number of animals of each species to be kept in every zoo and indicating the strategies for effective use of resources.

Conservation Assessment and Management Plan (CAMP) workshops were organized by the Zoo Outreach Organisation, Coimbatore on medicinal plants, amphibians, reptiles and fishes. A mammal CAMP will be held in August 1997 at Bangalore.

National Zoo Policy

A draft national zoo policy for India has been finalized and approved by the Ministry of Environment and Forest and is expected to be adopted by the parliament shortly. This policy enunciates in detail various steps that are to be taken for enhancing the conservation role of zoos.

Planned Breeding Programs

Bengal tiger: Twenty founder animals of Bengal tiger have been identified, and plans for their transfer to participating institutions have been finalized. Transponders have been placed in most of the animals.

Red panda: A masterplan for planned breeding of red pandas has been prepared with the help of the European Red Panda Specialist Group. A pair of red pandas has been moved from Padmaja Naidu Himalayan Zoological Park, Darjeeling to Himalayan Zoological Park, Sikkim under this program. Animals are also to be moved to Naintal Zoo in Uttar Pradesh.

Lion-tailed macaque: A workshop on the population biology of lion-tailed macaques was held at Coimbatore during October 1996. This workshop also finalized a masterplan for planned breeding of this species, and workshop recommendations are being implemented.

Asiatic lion/wild ass: The government of Gujarat has been requested to make animals available for the planned breeding of Asiatic lion and wild ass.

Publications

Last year the Indian Zoo Directors Association (IZDA) and the Central Zoo Authority produced a Zoo Yearbook. This year a proposal has been made to produce a compendium of all research papers published by Indian zoo personnel. The second volume of the Indian zoo yearbook is also likely to come out soon. The quarterly news journal continues to be the main vehicle of communication between Indian zoos.

Zoo Outreach Organisation (ZOO), Coimbatore continued its endeavor for strengthening the education component of the zoos. The two magazines, *Zoos' Print* and *Zoo Zen*, remain a source of invaluable

information on various aspects of zoo management both to the zoo managers and zoo visitors..

Biotechnology

The project on DNA fingerprinting of endangered species and genome banking progressed well at the Centre for Cellular and Molecular Biology (CCMB), Hyderabad. The Central Zoo Authority, however, wants a separate institute for working on these aspects with respect to endangered wild animals. A project for establishing a separate institute at an estimated cost of Rs. 55 million has been cleared by the government.

Grass Root Activities

The Central Zoo Authority is supporting NGOs in zoo education programs. The program has developed well in Trivandrum, Delhi, Patna and Calcutta. During wildlife week, students from rural areas were brought to zoos at Government cost. ■

Submitted by Sally Walker, CBSG, India.



CBSG, India Report

In the last year, CBSG, India has been busy with a variety of new and ongoing projects listed below.

CBSG Regional Network Task Force

After the Regional Networking Working Group meeting last year, CBSG, India attempted to keep the group in focus by initiating a CBSG Regional Network Task Force. Letters were sent out to all emerging and potential networks encouraging them to send news of their CBSG-related activities for circulation and inclusion in the network compendium. A new CBSG regional network which may come to fruition by direct efforts this year is CBSG, Sri Lanka.

Invertebrate Special Interest Group

Dr. B. A. Daniel, Chair of the Invertebrate SIG, visited London for one month, courtesy of London Zoo. Daniel learned techniques for maintaining and breeding invertebrates, and also spent time collecting information in the British Museum. Daniel runs an Indian invertebrate network which totals over 150 invertebrate researchers.

As a result of Daniel's visit and that of Sanjay Molur, CBSG, India Programme Officer the previous

year, a workshop on housing and breeding invertebrates in zoos was conducted at Coimbatore with funds from British Council, Southern Division. Earlier in the year Daniel, Sanjay and Sally Walker produced a concept plan for an Invertebrate Conservation Programme and Centre for the Madras Zoo at the request of the Chief Wildlife Warden of Tamil Nadu.

Amphibian Special Interest Group

CBSG, India supports the Declining Amphibian Populations Task Force-South Asia with help from FRAWG, Friends of Amphibians of the Western Ghats, a USA-based group. An Indian amphibian conservation network of almost 100 researchers has been developed with funds from Flora and Fauna International, and a directory is in progress.

Sanjay Molur represented CBSG, India at a Reptile and Amphibian conference in Sri Lanka in August 1996. He gave a half-day seminar on CAMP workshops leading to a request for assistance to organize CAMPs for amphibians, reptiles and medicinal plants of Sri Lanka.

Education Special Interest Group

The CBSG, India Education SIG, with help from Universities Federation for Animal Welfare, produced educational packets for zoo visitors for several zoos, focusing on good behavior in the zoo. More material is to be produced and the Zoo Ed Book revised with funds from the Royal Society for Prevention of Cruelty to Animals. Walker taught in a SEAZA zoo management course held in Singapore and provided books for all participants.

Zoo Advisory Activities

CBSG, India staff helped Coimbatore Zoo personnel prepare grant proposals for invertebrate and amphibian conservation projects, which were successful in obtaining grants from the Durrell Fund and the USA branch of Jersey Wildlife Preservation International. Working with the zoo staff is a regular activity, including occasional visits to the site, and reviewing research activities and educational material.

Third Indian Medicinal Plants CAMP

The third in a series of Southern Indian Medicinal Plants CAMPs was held in February 1997 during which 79 medicinal plants were assessed. The Foundation for Revitalisation of Local Health Traditions along with CBSG, India has pioneered several innovations in CAMP design.

Biodiversity Conservation Prioritization Project CAMPs

Most of our time during the last year has been spent in planning, running and reporting on seven all-India CAMP workshops for the Biodiversity Support Programme's project in India. So far five CAMPs have been held for 77 Northern Indian medicinal plants, 95 Southern Indian soil invertebrates, 208 Indian amphibians (all), and 480 (of 501) Indian reptiles [see *CBSG News* 8(1)]. Workshops are pending for Indian Mangrove Ecosystem species, Indian mammals and Indian freshwater fishes. New methodology has also been developed for obtaining information on a user-friendly data sheet with specific questions called a Biological Information Sheet.

An exciting development resulting from the medicinal plants workshop was that the Ministry of Environment used the output from the four workshops to add species to their Negative List of Exports and the Wildlife Protection Act. A special CAMP to reassess 18 contentious species has been scheduled and will be funded by the Ministry of Environment. ■

Submitted by Sally Walker, CBSG, India.


CONSERVATION ASSESSMENT & MANAGEMENT PLAN (C.A.M.P.) WORKSHOP FOR

SELECTED MEDICINAL PLANTS OF INDIA

Prioritization of endangered species under the Biodiversity Conservation Prioritisation Project (B.C.P.P.)


21 - 25 January 1997
Kukrail Park, Lucknow

Forest Department of Uttar Pradesh
National Botanical Research Institute
Central Institute for Aromatic and Medicinal Plants
World Wide Fund for Nature, India
World Resources Institute
The Nature Conservancy
USAID
Sri Aurobindo Centre for Ornithology and Natural History
Zoos Outreach Organisation/CBSG, India



***Aconitum ferox* Wall. ex Ser.**

Status: Vulnerable due to excessive collection for medicinal use
Distribution: Himachal Pradesh to Sikkim.
Endemic (DOB 1996)



CBSG Indonesia Report

CBSG has a good reputation for promoting conservation in Indonesia, since first using computer-generated population models of black-footed ferrets introduced in one of the PHVA workshops in Indonesia. Scientists involved in the PHVA process find it an extremely useful scientific approach to the conservation of endangered species, and want to better learn the process and apply it to more species in need of assessment.

Therefore, the local conservation authority recognizes CBSG's ability to assist in the development of conservation strategies for Indonesian endemic species. This has also led to the formation of a large network of local scientists now being organized under the auspices of CBSG Indonesia.

The PHVAs organized by CBSG in Indonesia have been very useful in terms of encouraging wildlife conservation in the country. PHVA workshops on the Javan hawk-eagle, anoa and babirusa have been conducted in May and July 1997 respectively. Following these workshops the Ministry of Environment has established a working group on the Javan hawk-eagle, whereas the Indonesian Institute of Sciences together with the Nature Conservation and Wildlife Management agency (PHPA) and NGOs (Fauna and Flora International, BirdLife International, Taman Safari Indonesia, and some local NGOs) have also developed an action plan for the conservation of Javan hawk-eagles.

The Government of Indonesia has expressed interest in conducting a workshop on confiscated animals. It is hoped that CBSG can assist in the organization of this workshop. CBSG has had experience in conducting a similar confiscation workshop recently in Costa Rica. ■

Submitted by Jansen Manansang, CBSG Indonesia.



Giant Pandas Outside China Working Group Report

The Working Group on Giant Pandas Outside of China met three times during the CBSG meeting, then a subgroup comprised of 12 individuals met after the meeting. This subgroup's recommendations can be found at the end of this report.

Preamble

- The conservation of the giant panda in the wild remains a matter of most serious concern.
- A self-sustaining population is an identified component of the Chinese National Plan for the conservation of the giant panda and its habitat, approved by State Council, produced by the Ministry of Forestry with the assistance of WWF.
- The captive population of giant pandas inside China is not self-sustaining, though large enough to be so with improved breeding success.
- The captive population of giant pandas outside China is extremely small, and could not be self-sustaining (see Table 1).

Aims

- To recommend ways in which the breeding potential of all giant pandas outside China can best be exploited and maximized.
- To develop a set of recommendations to be carried forward to the IUDZG – World Zoo Organization Conference.

Highlights of Major Recommendations

The Full Working Group recommends:

- the integration of all giant pandas outside China into the consolidated Giant Panda Masterplan, formulated in December 1996 between the Ministry of Construction and CBSG, and still in development.
- that annual physical check-ups for biomedical analysis be carried out; data should also be collected on individual's reproductive status, and skin biopsies and hair should be collected for genetic analysis.
- systematic review of protocols for freezing and thawing of semen be carried out, with semen being collected from all males, unless contraindicated, and that semen be routinely collected from animals that die.
- that, if more animals are to be moved in future, some standardization of diets be implemented.
- the development of a common protocol for the collection of reproductive material post-mortem.

The Full Working Group, *acknowledging* the political sensitivities involved and *without* recommending it at this stage, *suggests* that consideration be given to the idea that institutions/countries relinquish state gift status, and allow animals' ownership to revert to China.

Chinese Masterplan

The Ministry of Construction formulated a Masterplan for Giant Pandas in December 1996 in collaboration with CBSG; it will be further considered in September 1997 at the Threatened Species Festival in Chengdu. The plan focuses on improving *substantially* the breeding performance of the captive population of giant pandas in Chinese zoos and breeding institutions.

Table 1. Current holdings of giant pandas by institutions outside of China.

	<u>Inventory</u>	<u>Breeders</u>	<u>Origin</u>	<u>Semen storage</u>
Berlin	1.1 (pregnant?)	1.1	SG/MOF	yes
Paris	1.0	0.0	SG	?
Washington	1.0	0.0	SG	yes (still?)
Mexico City	1.3 (pregnant?)	1.3	SG/OSG/OSG/OSG-ZSL	possibly
San Diego	1.1	1.1	MOF/MOF	yes
Tokyo	1.2	1.1	SG/SG/OSG	yes
Seoul	0.2	0.2	MOC/MOC	no
Wakayama	1.0	1.0	MOC	no
Total	7.9	5.8		
			KEY	
Proven	0.0		State Gift; Offspring of SG	
Wild Born	2.1		Zoological Society of London	
Captive Born	3.7		Ministry of Construction	
			Ministry of Forestry	

Work on reproductive data collection in many Chinese zoos has already started, as specified in the Masterplan, and continues; further action points in the Plan are in the process of implementation.

The Plan already considers those animals on loan from the Ministry of Construction as part of the available gene pool for the Masterplan (but not those animals on loan from the Ministry of Forestry).

It was recommended that discussion of the Masterplan at the September meeting in Chengdu should include explicit consideration of the animals outside of China.

Sub-Group Recommendations

Following the report of the working group in Plenary in the last session of the CBSG meeting, concerns arose that a stronger series of recommendations concerning giant panda management should be made. As a result, a subgroup of 12 people met following the meeting and made the following recommendations:

- The subgroup echoes the recommendation that all giant pandas outside China be integrated into the 1996 Chinese Giant Panda Masterplan, formulated in collaboration between the Ministry of Construction and CBSG, and still in development.
- The subgroup suggests that the captive population outside China should be concentrated in breeding and research centers, each containing sufficient numbers of animals to provide for responsive management that will achieve optimal breeding and scientific research results. The appropriate number in each center will depend upon the development of an effective plan, based on enough animals to allow management freedom and multiple interactions between animals.
- While recognizing that public exhibition of threatened species can encourage support for and public understanding of conservation issues, it was further suggested that giant pandas outside China be kept off public display during breeding season to facilitate propagation, to facilitate scientific research, and to act as a strong political statement reflecting the commitment of the world zoo community to the conservation of this species.
- The subgroup further considered the recommendation that no more giant pandas be sought by institutions outside China except as part of the consolidated Masterplan, and with specific emphasis on significantly improving scientific knowledge relevant to their conservation.

Members of the IUDZG-WZO were asked to endorse recommendation #1 above, and to note other

matters that the CBSG Working Group considered, and which require further discussion and analysis. ■

Submitted by Jo Gipps, London Zoo.

World Wide Web Working Group Report



The next century will see an appreciable rise in the demand for conservation information. There is a global interest in the environment and a general improvement in economic and political living standards. Our rapidly expanding human population is increasingly computer-orientated and use of the World Wide Web (WWW) is growing exponentially. This working group agrees that the WWW is a valuable medium for the efficient and effective transfer of information and should be developed as a conservation resource.

Advantages of the WWW are that it is economic, quick, accessible, and opens links/contacts/expertise that is usually not available. Problems with the WWW include:

- Needs a telephone/modem connection and technical problems still exist in many countries
- Can be difficult to encourage staff to use
- Currently takes a long time to identify where information is held
- Using appropriate definitions for search engines can be difficult

Recommendations for enhancing the usefulness of the WWW to CBSG are:

- To establish a Working Group to undertake a detailed assessment of the WWW, utilizing the interdisciplinary expertise available from several diverse sources including regional zoological organizations and Sci-Net. This could form part of a future steering committee.
- Collate details of databases currently in use and under development.
- Research the potential for the development of customized information tools such as a search engine (incorporating Diary Notice Board of Future Events, Discussion Forum of Conservation Issues, Directory of Expert List-serves, E-mail Directory of Relevant Conservation and Species-orientated Groups) and/or multimedia database to service the needs of CBSG. ■

Submitted by Richard Perron, Quantum Conservation.

Invertebrate Working Group Report



Participants

Due to a lack of available Invertebrate Working Group members it was necessary that this year's group session be conducted in a more informal manner with a series of *ad hoc* discussions with interested individuals.

Main Issues Reviewed

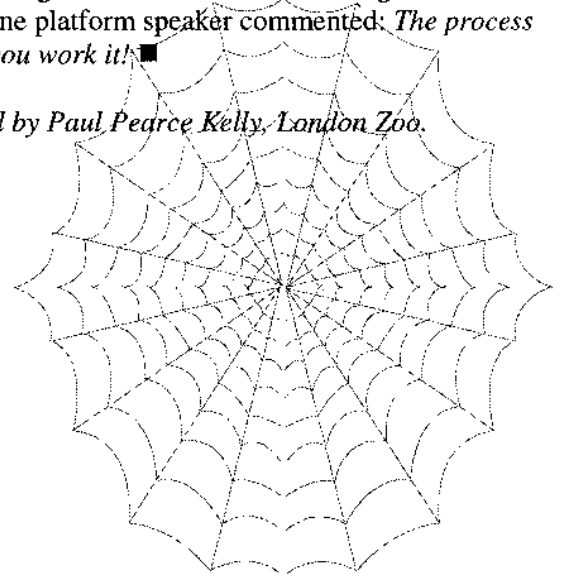
- This group has made progress in producing and gathering together existing technical invertebrate interpretation, husbandry and conservation program materials, although considerable work remains to be done.
- The complication of a global directory/network of invertebrate specialists and organizations is also progressing well given the widely varying levels of current regional group activity in gathering, collating and distributing such data.
- Concerted efforts will be required if we are to fully develop the desired regional invertebrate groups, either through networking with existing organizations or by establishing new groups where such organizations are absent.
- The recent establishment of the EEP Terrestrial Invertebrate TAG, together with the UK Federation Invertebrate TAGs is seen as effectively filling a regional group role for realizing the commonly shared CBSG Invertebrate Group aims and objectives within the European region. However, there is a continuing need for improved representation of aquatic invertebrate conservation matters within the EEP region.
- The American Terrestrial Invertebrate TAG and the Aquatic Invertebrate TAG are recognized as constituting the most effective groups, in terms of commitment and specialist knowledge, to fill the role of a CBSG invertebrate group for the American region. There is a long standing American regional Co-Chair (R. Morgan, Cincinnati Zoo) and it is hoped that discussions with the current Co-Chair will clarify who within the American region is best placed to take this process forward.
- The excellent work of the Indian Invertebrate Specialist Group is seen as very actively filling a regional role for India, and it is hoped that in time this group may be able to extend its coverage to include adjacent countries. The proactive efforts and regular distribution of data and materials by this group are particularly commendable.

Key Actions Needed

- Continue efforts to produce, gather and make available general and technical data and guideline materials for the conservation community and other relevant parties.
- Continue efforts to compile a comprehensive global directory/network of invertebrate specialists, groups and organizations and make this information as readily available as is practical.
- Compile a collection of published data pertaining to invertebrate conservation matters and ensure that such material is as widely distributed as is practical. This data should also include summary data on past and current invertebrate recovery programs (zoo-based or otherwise). Ideally such program profiles should include a photographic element. Active regional groups are seen as being essential in compiling and distributing such materials. PPK is willing to cover the costs of duplicating any materials received and forwarding materials on to all regional groups in order to ensure that each region has direct access to comprehensive data.
- Strengthen links with the American Terrestrial and Aquatic Invertebrate TAGs so that, as is the case with the EEP Terrestrial Invertebrate TAG, these groups might effectively fill the role of a regional CBSG invertebrate group, thus ensuring maximum results with minimum additional workload.
- Examine the potential of establishing a zoo-based Co-Chair position for the Australasian regional group to strengthen current links between the zoo, museum and university communities.
- Examine the feasibility of establishing a regional group for Africa and Middle East. It is envisioned that this will best be achieved through establishing links with existing in-region academic invertebrate organizations.

As one platform speaker commented: *The process works if you work it!* ■

Submitted by Paul Pearce Kelly, London Zoo.



Confiscation Working Group Report



Participants from various regions reported different problems. Regions of high biodiversity such as Mesoamerica and Indonesia have large numbers of mainly native fauna confiscated which go to the already overloaded zoos and, where available, rescue centers. Eastern Europe also has large numbers of animals confiscated from a wide range of taxa. Western Europe and the United States have smaller problems and usually better facilities to deal with them.

At a confiscation workshop held in El Salvador in June 1997, data sheets were developed for rescue agencies - one for deciding what to do with any confiscated specimens of various local taxa, and another for recording data on animals of a particular taxon confiscated each year and what happened to them. They also produced map of the locations of confiscations. These allowed the workshop to produce lists of recommendations for local wildlife agencies on what to do with the various commonly confiscated taxa. It might be useful for other regions to perform similar exercises.

A confiscation workshop is planned for Indonesia within a year.

Recommendations

- The decision process in all cases should follow the IUCN guidelines. However, the group wishes to recommend to the Reintroduction Specialist Group that, where endangered species are concerned, they include in the captive sections of the decision process consideration of the existence of a managed conservation breeding program anywhere in the world for the taxon. If a managed program exists, and other factors allowing, the animal should be sent preferentially to an institution participating in that program.
- Workshops should be held in each region to discuss confiscation problems and solutions. CBSG can assist if desired.
- Suggested first step: compile lists of taxa usually confiscated and circulate to regional and/or national zoo associations or other appropriate bodies. Zoos in other regions may be interested in some of them. The data sheets compiled at the El Salvador workshop are available from CBSG and can be used as they stand or adapted to suit local requirements.
- Suggested second step: evaluate the conservation importance of as many of the commonly confiscated taxa as possible. If there are too many to assess at

once, the biggest problem species and the most endangered species should be targeted first.

- Rehabilitation centers should be licensed and strictly controlled to prevent illegal trade and inappropriate releases. Licenses might be issued by the government of the country concerned or perhaps by a global system under IUCN.
- The group identified a need for distribution of relevant information to key political appointees (e.g., CITES management authorities) in countries with large confiscation problems so that they better understand the problems. Appropriate information includes existing policies on confiscated animals from other countries and the IUCN guidelines.
- The group recommended that conservation education include issues pertaining to the problems of confiscated animals. ■

Submitted by Yolanda Matamoros, Simon Bolivar Zoo.

Conference on Endangered Species Working Group Report

The working group discussions began with posing of the question "Do we need conferences on breeding of endangered species?" Working group participants agreed that such conferences were vital, filling a unique niche for the dissemination of interdisciplinary knowledge about the breeding of endangered species in captivity. These conferences also provide a venue for research discussions which are able to provide a good mix between case studies and goal-oriented discussions which address more general issues.

Development of a conference of this nature will require a great deal of long-range planning and coordination. The working group recommended that a standing committee, with organizational responsibility, be established. This committee would be comprised of one representative each from the World Zoo Organization, CBSG, and Flora and Fauna International. It was agreed that the conference should be hosted by a zoological institution. Selection of the host institution will take place via an application procedure and evaluated against criteria which may be developed by the standing committee and their organizations.

In the past, conferences have been convened approximately every four years. It was agreed that this should continue, with the lapsing interval between conferences not to exceed five years, with public

announcements and advertisement beginning at least one year prior to the conference date. The working group recommended that the duration of the conference be 4-5 days. Conferences should be topic-based or centered around a series of topics. It was recommended that the conference topic(s) be developed collaboratively by the CBSG Steering Committee, the World Zoo Organization Council, and Flora and Fauna International. The standing committee will work closely with a conference scientific committee to evaluate submitted papers so that the quality of presentations and posters at the conference is of the highest quality. It also was agreed that close attention should be paid to the structure of poster sessions, perhaps giving poster presenters an opportunity to give a short oral presentation in a plenary session.

It also was agreed that as part of the selection criteria for host institutions, the host institution must agree to publish the proceedings in a separate, accessible format with international distribution. This publication should be thoroughly edited, of the highest quality, and fully represent the broad, international scope of the conference.

The working group also discussed the format and structure of the conference, and strongly recommends that the program be balanced between formal presentations and working groups. One recommendation is that topic-based presentation sessions be followed by working group sessions that would promote discussions of issues stimulated by the session presentations. In addition, this would facilitate the face-to-face contact and networking that not only catalyzes creativity and new conservation directions but also personally energizes the conference delegates. These working group sessions should be facilitated by people with demonstrated facilitation skills. Facilitators should be notified in advance and perhaps could participate in a half-day facilitator's training course just prior to the conference to provide for consistency in working group sessions.

It is recognized that the hosting of a meeting of the scope and nature of the Breeding Endangered Species in Captivity conferences takes a great deal of resources, financial and otherwise. It was recommended that emphasis be placed on finding support that will enable substantial participation by representatives from less-developed countries. One means by which this might be achieved is to promote sponsorship of range-country participants by developed-country zoos. ■

Submitted by Jeremy Mallinson, Jersey Wildlife Preservation Trust.

Biodiversity Convention Working Group Report



In March 1997, the IUCN Biodiversity Policy Coordinating Division requested the World Conservation Congress (WCC) Mandate on Biodiversity and Opportunities to comment on Species Survival Commission input into the Convention on Biodiversity Process.

The Report of the Program Committee adopted by the World Conservation Congress identified the conservation of biodiversity as the primary focus of the IUCN and called for support of the three objectives of the Convention on Biological Diversity (CBD): conservation of biodiversity; sustainable use of biological resources; and equitable sharing of the benefits of this use. The Species Survival Commission has a major opportunity to support the WCC mandate on biodiversity conservation. Ten specific areas have been suggested in which the SSC can support the implementation of the CBD:

1. Identification/monitoring of biological diversity.
2. Identification/monitoring of the underlying causes of biodiversity loss.
3. Invasive alien species.
4. Conserving agricultural biodiversity.
5. Sustainable use.
6. Incentive measures.
7. Clearing house mechanism.
8. Linking *ex situ* biodiversity back to *in situ* biodiversity.
9. Public awareness.
10. Research

As a specialist group of the SSC, CBSG has built up a large repertoire of conservation tools and techniques as well as an impressive group of conservation experts as collaborators and partners. Its unique position allows CBSG to take on a substantial role within the SSC in helping signatory nations fulfill their commitments to the Biodiversity Convention in several of these areas.

CBSG Input into the CBD Process

Identification and Monitoring of Biological Diversity

Identification and monitoring of biological diversity can be done using CAMP workshops within a country or region to list species in all plant and animal groups and categorize them according to their conservation value using the IUCN Red List criteria. Follow-up exercises after several years would provide field

biologists with an opportunity to cover additional areas and to monitor species.

PHVA workshops also provide a methodology both for monitoring biological diversity, species-by-species, and also for identifying the underlying causes of biodiversity loss. In particular, when a species is in danger of irretrievable decline, a PHVA workshop can assess the causal factors and degree of risk faced by the species.

Also, a major role of CBSG is that of disseminator of information, utilizing printed as well as human resources. Basic materials such as the Guide to Biodiversity and the IUCN Red List Guidelines are examples.

Sustainable Use

The Sustainable Use working group has explored this topic thoroughly (see p. 25) and concluded that PHVA workshops can be used as well to assess large populations of wildlife which may be used sustainably to determine the effect on the population of different degrees and types of use as well as the effect on habitat and other species. CBSG can also use the considerable expertise and opportunity of its members to educate zoo visitors and other groups such as policy makers about the various aspects of sustainable use.

Linking Ex Situ Biodiversity to In Situ Biodiversity Global Captive Action Recommendations (GCARs).

CAMP workshops identify species in need of conservation breeding and PHVAs help pin point the level of captive program required. GCARs are developed based on the degree of endangerment and the recommendations for captive breeding of a species.

In reintroduction programs, the knowledge and understanding of threats can be enhanced by consideration of CAMP data.

Reintroduction. Zoos and other captive breeding facilities maintain stock which now are managed genetically and demographically so that they can be used to strengthen wild populations either by reintroduction of animals or their genetic material, to replace a population which has disappeared, or to start an alternative population in a safer area. Reintroduction programs should not be attempted without an environmental assessment (e.g., PHVA) and understanding of threats (e.g., CAMP).

Recovery. Zoos have the capacity to breed animals quickly such that recovery programs, in which a species has declined to a point of no return without active intervention, are a means of saving a species.

Research. Findings on captive animals can help with wildlife management.

Conservation Linking Programs. Zoos can help range countries in specific protected areas, both directly with funds and technology and by locating resources from other agencies. CBSG has expertise in problems faced by agencies conducting reintroduction programs.

Public Awareness

CBSG can use its vast constituency of zoos and zoo educators to teach and create awareness of biodiversity, the Biodiversity Convention, and citizens' individual responsibilities toward it. Zoos attract a captive audience of millions every year, and their educators and programs can be used to convey difficult concepts in a manner that will make maximum impact.

Research

CAMPs link field biologists, academicians, zoo personnel and other relevant groups through their activities and processes. A more sustained effort to promote these efforts and the tools to relevant policy makers in signatory nations to the Biodiversity Convention should be done.

Much of the knowledge of the biology of wild animals and their needs comes from zoos. In addition, CBSG has catalyzed a broad range of subject areas of relevant and crucial research which is of direct use to the conservation of biodiversity.

CBSG has expertise in policy-making, global discussions, and organized collection, storage and use of biological material for the establishment, maintenance and use of genome resource banks.

Experts in the SciNet network (see p.27) provide advice to range countries in a variety of topic areas as well as conduct or assist in conducting exercises.

Training (Technology Transfer)

CBSG has years of training experience both as initiators and collaborators with zoos, zoo associations, conservation organizations, etc. in a variety of both long-range and capsule technology transfer or training programs. Some of these areas are: wildlife training; zoo biology, husbandry, genetic management of captive populations; facilitation and problem solving skills; small population biology; development of new tools; and reintroduction technology.

Alien and Invasive Species

CBSG processes frequently uncover alien and invasive species as threats to other species with which it is working. The major issues involved are predatory and competitive species and disease threats. ■

Submitted by Sally Walker, CBSG, India.

Sustainable Use Working Group Report



This working group addressed two primary issues:

1. What can zoos do to positively effect sustainable use issues?
2. How do CBSG processes address sustainable use and how could those processes be modified to more effectively address those issues? Should a new process be developed specifically to address this issue?

Zoos and Sustainable Use

Zoos in all countries conduct education programs that reach an estimated 600 million people annually, including a particularly high proportion of children. Zoo education programs are constantly evolving and should go beyond a focus centered on single charismatic species to encompass the concepts of ecosystems and sustainable use. As part of these education programs, zoos should first include a display of local flora and fauna. This local species display can then serve as the basis to explain sustainable use of natural resources.

Zoos can effect sustainable use through hosting workshops on topics in conservation, including sustainable use. Zoos can also directly impact the topic of sustainable use through participating in and hosting CBSG processes. Finally, zoos can address sustainable use through their ability to act in pivotal roles to influence corporate, community and government policy.

CBSG Processes and Sustainable Use

The PHVA process incorporates sustainable use as a factor in the Vortex model when it is a significant factor for the species being addressed. Most PHVAs address this topic also in working groups related to human interactions with the species. The CAMP process incorporates sustainable use into the information accumulation portion of the process when it is a factor affecting a species. No new processes seem to be needed to address this issue, but the effectiveness of these processes could be improved for this specific purpose.

Two models may provide some benefit in adapting CBSG processes to more specifically address human-species interactions and sustainable use. The CAMP process was applied directly and extensively to impact sustainable use issues in India during the Biodiversity Assessments undertaken by CBSG, India. In addition, the USFWS Habitat Conservation Plan (HCP) process brings together all stakeholder groups in a specific area or ecosystem to address sustainable use

issues prior to decision-making regarding changes in use of that area. Both of these processes may provide a useful model for CBSG as it adapts its processes to more fully incorporate sustainable use issues. The working group also recommends that CBSG consider the following modifications of its pre-workshop and workshop activities in order to address more fully the questions involved in sustainable use.

Fully assessing sustainable use issues clearly requires that all stakeholders involved in that use be included in the CBSG processes. These stakeholder groups need to be actively recruited and supported to participate in the workshops since they would normally be outside the loop of persons involved in conservation. Additional disciplines that would be useful at PHVAs and CAMPS to address sustainable use issues include sociologists, recreation planners, regional, city or area planners, and human population demographers.

Sustainable use must also include consideration of the following issues:

Institutional: Who owns and manages the species being addressed, what agencies, groups and organizations participate in its management.

Use systems: Who is using the species and for what purpose.

Economic: Economic value of the product, and the economic status and factors of both the collectors or harvesters of the species and the final consumers.

Biological: Demography and life history parameters of the species.

Human demography: Historical, current and projected demographic trends.

Cultural: Factors influencing the use pattern.

Tools: Adaptive management strategies and outcome monitoring techniques.

Issues concerning sustainable use must be addressed using accurate information and careful consideration of the factors impacting that use. Accurate information must be collected prior to workshop activities whenever possible, and participants need to reflect on the issue and options prior to the workshop. Consequently the working group recommends that CBSG consider incorporating the following specific adaptations of pre-workshop questionnaires and lists of information to be collected in order to make sustainable use issues more definable and quantifiable.

Use Pattern

- List all uses of a species, both legal and illegal.
- Identify which uses are consumptive and which are non-consumptive (fruit, body parts, ecotourism, pet trade, recreation, etc.).
- What is the impact for the species with each use?

- Is legal collection regulated? How does illegal use affect legal use regulation?
- Does the use reduce the species population?
- Distinguish immediate need uses (e.g., providing today's meal) from less immediate need uses (e.g., sale of meat in a market, capture for the pet trade).
- List alternatives to essential uses.
- Is there a direct relationship or similarity between this species and any other species that is being used or farmed?

Demography

- Who is using the species? How big is that group? Projected demographic trends of that group?
- How is local land managed or owned (private, community, clan, government ownership)?
- What is the outcome of not using the species for the user group and for the species itself?

Biology

- What sexes, ages and life cycle stages are targeted?
- What time of year does take occur?
- What percent of offtake is possible without endangering the population?
- In what context does percent of offtake need to be changed or reevaluated?
- How can use impact be monitored?
- What stochastic events are probable (environmental, political, financial)?
- What species population outcomes are predictable?

Management Systems

Empower local management groups to sustainably manage regional populations of a species. Local groups may need to be educated in why and how to manage a species sustainably. Alternatives need to be suggested or recommended if use is nonsustainable and in alternative values of species (ecotourism vs. poaching). An example of a successfully applied community based conservation project is the Anapurna Conservation Area Project in Nepal.

Non-endangered Species Application

The PHVA process needs to be applied to some non-endangered species populations that are currently being apparently sustainably used in order to assist regional management authorities to develop useful management plans, project future outcomes at current use levels, and project outcomes of changes in use patterns or demographics. This would provide wildlife managers with a practical tool they could use in their animal management planning and may function to keep

a species that is not currently endangered from becoming endangered.

Recommendations

1. CBSG processes should be applied to species other than threatened or endangered species. The PHVA process is an especially powerful tool to estimate sustainable yields of wild species and can identify strategies and management technologies for ensuring sustainability.
2. Human demography and utilization of wildlife resources should be integrated to a greater degree into the CBSG workshops.
3. The CAMP process could be highly successful in identifying wildlife resources, that offer possibilities for serving the needs of people, especially indigenous people in developing nations. Obviously, the futures of all species should not be hinged in the market place, nor can all species be consumptively used.
4. Zoos have enormous potential in educating the general public about conservation and environmental issues and processes in the natural world. They should go beyond a single species focus by addressing ecosystem and landscape scale use and management.
5. Zoos, by their very nature, extend a philosophy of protectionism. Education programs by zoos should make special efforts to promote sustainable use of wildlife as a strategy in conservation of wild stocks.
6. Community-based conservation, which includes sustainable use in whatever form it takes, is a key to success. CBSG might develop workshops to demonstrate how and in what contexts community-based conservation projects might be implemented. ■

Submitted by Jim Teer, Welder Wildlife Foundation.

National Sovereignty Working Group Report

Australian Ambassador Species Agreement

Concerns

1. Receiving zoo becomes unable to trade commercially in any native Australian fauna - not just the subject of the agreement (even those in pet shops).
2. Create black market in "Agreement-free" animals.
3. Does return of money to conservation programs or non-for profit organizations constitute trade/dealing?

4. Perception of increased "red-tape".
5. Provoke restrictive reaction from other zoos/countries including sharing of research.
6. Australian animals will become poorly represented in overseas zoos.
7. Regulating the "better" zoos while other poorer quality zoos will not be affected.
8. Will take longer to acquire animals.
9. Not a clear issue in continents of multiple sovereign states like Europe.
10. Could increase the risk of poaching.

Potential Benefits

1. Encourages nations to treat their native fauna as a part of their heritage rather than as a commercial resource.
2. Restricts commercial trade.
3. Encourages proper standards of husbandry.
4. Encourages establishment of complete studbooks and/or regional animal management programs for Australian natives held outside Australia.
5. Discourages inappropriate exploitation/treatment of Australian fauna i.e. commercialization.
6. Encourages funding of in situ conservation projects.
7. May inspire other "biodiversity hot-spot" countries to follow suit.
8. Meets responsibilities under the Rio agreement.
9. Facilitates future access to Australian fauna for zoos that are willing to apply high management standards.
10. Encouraging zoo-to-zoo transactions will promote husbandry and management advice and resources.
11. Draws a clear distinction between approved zoos and commercial traders.

Further Comments

1. Possible applicability to Australia, China, Africa, Central America, and South America.
 1. Not without precedent e.g. under EEP, any country involved must follow recommendations.
 2. Contributions to conservation programs at the time of export does not equate to sale.
 3. The Australian federal authority recognizes regional association programs like the EEP.
 4. Australia unique as a developing country with extremely high biological diversity.
 5. Pertinent is the thought (raised again at the recent CITES meeting) that ALL zoo-to-zoo exchanges should be listed as commercial transactions. International zoo community needs to be proactive on this issue.
 6. Instructive example is that instigated by Jersey whereby the ownership of all the golden lion tamarins in the world was "signed-over" to Brazil. This led to

- the mistaken perception in some cases that all the animals were going back to Brazil.
7. Need to clarify that, under the Australian agreement, a regional management program is required but responsibility for coordination of the program is left to the region concerned i.e. Australian government will want to know that the program is being managed appropriately but will not want it managed from Australia.
 8. The option to have small regional populations (e.g. five Koalas in Europe) managed as part of the Australian program remains open to the regional zoo associations concerned.
 9. Suggest to the Australian government that the type of species subject to such agreements needs to be defined and that a time frame and opportunity to review the operation of the agreements be considered.
 10. Noted that most concerns raised relate to a lack of communication/understanding of the issue. All opportunities to clarify the issue should be pursued.

Draft CBSG Position Statement on National Responsibility for Native Fauna as It Relates to the Management of Captive Animals

Recognizing

- the issue addressed is not one of property ownership, rather it is one of responsibility and control;
- the Australian agreement refers to particular species, at the moment Koala, Tasmanian Devils and Wombat, not every specimen of Australian fauna (the list of referenced species needs clarification);
- the thrust of such agreements accords with the Convention on Biological Diversity, and for that matter, the protocols already in place at most zoos concerning animal welfare, veterinary and husbandry standards, studbook and animal management plans;
- applicability of such agreements to other countries/regions, particularly regions of high biodiversity;

The CBSG acknowledges the importance of both national sovereignty in the conservation of native fauna and the potential for zoos to contribute to conservation.

The CBSG promotes agreements that give sovereign states ongoing influence over animals that have been sent to zoos outside the sovereign state.

Recommendation to the WZO

The working group proposes that CBSG recommends WZO develop a position on this issue. ■

Submitted by Christine Hopkins, ARAZPA.

SciNet Working Group Report



Since CBSG processes are based on science, the CBSG Science Network (SciNet) was formed to expand the range of scientific expertise available to the organization. Inclusion of individuals in the network is based on three criteria: 1) expertise in their field of specialty; 2) reliability and proven performance upon which CBSG can depend; and 3) ability and willingness to participate in a team process.

Specialties/Leaders

Of the ten specialties identified, four are still without leaders. The specialties and leaders, where identified, are as follows:

- Reproductive Biology/GRB - D. Wildt
- Behavior - J. Mellen
- Nutrition - S. Crissey
- Captive Husbandry - D. Morris/J. Grisham
- Organizational Mgmt/Human Dimen. - F. Westley
- Population Biology - P. Miller
- Veterinary Medicine - E. Miller
- Molecular Genetics -- OPEN
- Wildlife Management -- OPEN
- Education - OPEN

The group recommends that the remaining positions be filled as soon as is feasible. Additionally, initial disciplinary membership lists have been submitted for only four of the seven disciplines with leaders. Top priority should be given to the further development of those lists and, in particular, the list of members from the remaining three disciplines.

Identifying New Members

In identifying members of the SciNet, diversity of expertise, taxa interest, and geographic location of the scientists was discussed and considered integral to the success of the SciNet. To enhance the diversity of the group it is recommended that:

- Stronger emphasis be placed on using regional specialists to supplement the present Disciplinary Leaders. For a variety of reasons, it is also recommended that the current term Disciplinary Leaders be replaced by Disciplinary Coordinators, and the regional subgroup leaders be called Disciplinary Leaders. These disciplinary leaders should distribute pertinent CBSG materials using appropriate phrasing for each region.
- Stronger emphasis should be placed on using regional zoo organizations as one source of recommendations for SciNet members. It is recommended

that E. Miller contact leaders of regional zoo organizations and request recommendations from them for a selected number of specialists in each discipline.

- CBSG should publish a list of Disciplinary Coordinators in the newsletter with a *request that interested parties contact the Coordinator of the appropriate discipline for further information.*

Additionally, it was noted that new members need to have a clear understanding of their commitment. They also need to understand that when SciNet members are invited to a CBSG function (e.g., PHVA, CAMP), the commitment of CBSG is generally limited to travel funds. In addition to distributing the description of duties, clarification of the commitments of and benefits to SciNet members as outlined below should be presented to the participant.

Commitment of Participant

- Time commitment is irregular and infrequent.
- Responsible for literature review and information collation prior to the meeting.
- Preparation of a presentation for the meeting.
- Participation in the meeting including a minimum of one week of time for travel and attendance.
- Participation in preparation of the report of meeting working group and recommendations.
- Be willing to accept phone and fax informational calls from the CBSG office.

Benefits of Participating in the Workshop/Process

- Professional development.
- International service to the field.
- Cost-effective way to share expertise and learn new tools and methods.
- Furthering your discipline.
- Networking -- personal, institutional and professional.
- Furthering conservation goals/ helping save endangered species.

Glossary

To facilitate communication, each Coordinator should produce a glossary of terms used in their data request sheet (see below under other). Each Coordinator should emphasize to SciNet members in their area the need to use the simplest, most widely understood terminology when writing reports and other documents. Additionally, the group decided that the CBSG office should create a one-page description of CBSG and its functions, and a one-page glossary of CBSG terminology (e.g., PHVA, CAMP) to be distributed to the SciNet members.

Education

The group recommends that a Coordinator for the Education Specialty be appointed as soon as possible. The Coordinator should work with the International Zoo Educators (IZE) and other appropriate groups in developing their list of SciNet members. There was consensus that education is integral to, and should be included in, CBSG processes. Within one month of appointment, the Education Coordinator should develop a list of suggestions for when inclusion of an educator in CBSG processes would be most valuable.

Other

To facilitate the input of Discipline Coordinators, it is recommended that:

- When specific needs arise, the CBSG office contact Discipline Coordinators for suggestions and input.
- A copy of the CBSG schedule be distributed to each Coordinator for their review and suggestions for participants in upcoming meetings and processes.
- Training be offered at regional meetings of zoological organizations or at other locales that offers insight to Disciplinary Coordinators and SciNet members regarding CBSG's functions and processes. Such training may include an overview of a facilitator's function and role. These workshops should occur in the near future and occur in multiple regions.
- There should be feedback from CBSG regarding the performance of the SciNet participants invited to a CBSG meeting. This could include verbal review by CBSG staff or sending a copy of the SciNet member's report to the appropriate Discipline Coordinator.
- The CBSG office develop a list of standardized terminology for region and taxa data for discipline leaders to use in all lists.

It is recommended that minor modifications be made to the Directory Form. These changes include modifications by the Education Coordinator for use in their group, and including any limitation that the SciNet member may have as to time of travel.

The primary purpose of the SciNet is to provide scientific input for CBSG processes such as PHVAs and CAMPs. In order to obtain the most valuable and usable data, standardized data forms should be developed for each discipline. Each Coordinator should produce a data collection form appropriate to their discipline. This form should be submitted to appropriate peers for review and to O. Byers at the CBSG office.

Extensive discussion regarding appropriate distribution of the SciNet list as a resource led to the recommendation that next year's CBSG meeting include a working group on CBSG policy regarding

distribution of information, particularly individual address information. ■

Submitted by Eric Miller, St. Louis Zoo.

**Vortex for Windows
Working Group Report**



Use

Use of VortWin in Teaching

Below we list software features that are important to consider in order to assess whether the Dos Vortex or the VortWin has an advantage. As indicated below, VortWin has a clear advantage for educational purposes.

<i>Features important for teaching purposes</i>	<u>Dos Vortex</u>	<u>VortWin</u>
User interface	-	+
User friendliness and accessibility	-	+
Requires less computer experience	-	+
Hardware requirements	+	-
Online help given	-	+
Supporting literature	-	+

Use of VortWin in PHVA Workshops

Considering the present versions of Dos Vortex and VortWin, Dos Vortex is still more convenient for PHVA use. VortWin does however possess a number of features that would be valuable for PHVA use.

Since Dos Vortex was optimized for PHVA workshops, and VortWin was developed specifically for teaching, both versions have advantages and disadvantages in the two roles. However, the working group feels that VortWin is the preferred future tool for both teaching and PHVA workshops.

<i>Features important for PHVA workshop use</i>	<u>Dos Vortex</u>	<u>VortWin</u>
User friendliness	-	+
Hardware requirements	+	-
Simulation speed	+	-
Multiple scenario batch files	+	-
Multiscenario graphical comparison	+	-
Graphics for input and results	-	+
Presentation of results may require further statistical analysis	-	-

Ongoing Support and Maintenance

Currently Vortex improvement is done in the Dos version by R. Lacy. If VortWin were employed for CBSG workshops, there would be a need to identify a person/people to be responsible for further development (Lacy, Habekotte or both), and for transfer of new features to the VortWin.

Distribution

Pricing

CBSG will not produce or distribute VortWin until the software has been modified for PHVA workshop use. At present Dos Vortex is sold at 35 USD, which is cost of production.

The van Hall Instituut Business Centre normally charges ca 250 HFL for a software package, but there are indications that a lower price (50 USD) is intended for the VortWin product, since the actual simulation software was not developed by the Instituut.

The working group recognizes the costs involved in developing a software package, and that the person/company performing that work needs to cover its costs. Still, for the sake of conservation, the package should be easily available and as economic as possible. A two-tiered pricing system may be considered, but if the price of VortWin is as low as 50 USD, that may not be necessary. For users not able to raise 50 USD, a sponsoring program could be considered, with 'rich' institutes voluntarily paying for an extra package to be given away by CBSG.

Vortex author R. Lacy has no formal agreement with van Hall Institute about marketing of VortWin.

Distribution Process

A two-tiered distribution system may be feasible, with both CBSG and Van Hall distributing the VortWin package. The Van Hall Instituut is mainly interested in selling Vortex to other academic institutions, and CBSG has an interest to supply it to NGOs and other organizations directly involved in conservation work. A geographical division of distribution is also possible, with CBSG covering the Americas, and van Hall selling in the Old World. Production may be done at both places, as long as new developments are shared promptly.

CBSG/R. Lacy and Van Hall need to agree on:

- Who owns VortWin, considering that it contains original Vortex code?
- Who should produce VortWin, both CBSG and Van Hall or just the latter?
- If both, a standard manual format is needed.
- Price of package (preferably similar).

Future Directions

Modifications Needed for PHVA Workshop Use

For VortWin to be used in PHVA workshops a number of developments are needed:

- Make it faster: decrease memory usage, introduce an option for simpler storage of results.
- Implement multiple scenario batch running.
- Improve ability to compare results of numerous models (scenarios).
- Improve output format for use in other programs.

It is not always necessary to store results for each time point during the simulation; often the end-point is enough. Similarly, comparisons between runs should include end-point results, such as risk of extinction (y-axis) versus different values of K (x-axis). A CD-ROM with manual may be needed in the future.

External Acceptance

Among academic biologists there is still a wide spread suspicion that Vortex is unreliable, and it is often hard to persuade editors of refereed journals that Vortex is a valid scientific tool. We need a published article in a recognized refereed journal, describing the details of Vortex simulation algorithms, with complete transparency. This paper could then be referred to whenever a work based on Vortex use is to be published. For example, it is crucial for the Vortex user to know the exact order of events (e.g. population inventory, mortality, reproduction, migration) during a time step. Each such event is implemented in a simulation algorithm that can be expressed in a graphical or mathematical form, with assumptions and limitations clearly indicated.

Taskbook

The task book is being translated into Spanish. Additional languages may be useful, such as Chinese and Russian, but are not first priority. The Dos Vortex is available in Spanish and Chinese.

The taskbook should be expanded by including more exercises with more species of diverse life histories to illustrate how Vortex can be applied in different situations. ■

Submitted by Phil Miller, CBSG and Karin van Ewijk, National Foundation for Research in Zoos.



Partnerships and Building Collaborations

Effective strategies to address complex biodiversity issues will require interdisciplinary as well as cross-sector approaches involving the public and private sectors, local, state and national governments, and other interested parties. These interdisciplinary, cross-sector approaches will form the basis of partnerships or collaborations designed to address the convoluted and intricate nature of the biodiversity problems at hand.

In its efforts to work internationally with a broad range of interdisciplinary experts in a wide range of cultures, CBSG has developed a set of tools or processes to aid in scientific management of species and habitats, and to take into account the broad array of stakeholders necessary to develop comprehensive management and recovery plans. Each of the processes has in common the following:

1. The processes are designed to develop consensus.
2. All stakeholders and species specialists (who can attend) participate. The expression of all views is encouraged and as part of the ground-rules, participants are asked to put aside their personal and organizational agendas.
3. Participants are urged to work together for a common goal -- preventing the extinction of the species or group of species under consideration.
4. The processes are designed to extract expert knowledge that otherwise might be inaccessible, recognizing that approximately 80% of available knowledge is in people's heads and likely never will be published.
5. The processes allow pooling of resources. In many cases, we have found people that have been working on the same species in the same area for a number of years but have never had face-to-face discussions to address the issues or to collaboratively develop action strategies.
6. Outside expertise is sometimes utilized to provide fresh, unbiased perspectives.
7. The resulting workshop report and the recommendations it contains is "owned" entirely by the participants, who are responsible for their implementation.
8. CBSG serves only as a neutral facilitator. It never takes the approach of telling experts in other countries what they should do, but facilitates a process whereby in-country experts can make their own decisions about the management of their country's wildlife.

There are two primary CBSG workshop processes. The first is the Conservation Assessment and Management Plan (CAMP) process. CAMP processes focus on a broad group of taxa or a group of taxa within a particular region. CAMPs use existing infor-

mation on population status and trends, habitat status, and threats to assign taxa to IUCN Red List Categories of Threat. Based on the level of threat, recommendations made by workshop participants for research and management activities can be prioritized and used to develop comprehensive strategies. More than 60 CAMPs have been held since the program began in 1991.

The Population and Habitat Viability Assessment (PHVA) process focuses on a single species and uses available data combined with computer simulation modeling to characterize the species' risk of extinction and its sensitivity to various factors acting on its populations. Sensitivity analyses take place, which test a species' sensitivity to various management strategies. Based on the models as well as intense, interactive discussions among workshop participants, an integrated management strategy is developed by stakeholders. More than 80 PHVA workshops have been held since the beginning of the program in the late 1980s.

At the same time CBSG's workshop processes are designed around the principles described above, it also must be recognized that there are certain human behaviors, present across disciplines and across cultures, that affect communication, problem solving, and collaboration. People differ in their world views, which influences how they acquire, share, and analyze information. They differ in their perception and characterization of risk. People also differ in their willingness and ability to trust others. Finally, territorial issues, whether personal, institutional, local, or national, must be acknowledged. This is not to place a value judgment on these factors -- but in order to facilitate working together across disciplines and across cultures, they must be acknowledged as fundamental human characteristics.

Workshop processes are scientific as well as social processes. Workshop participants work together to characterize problems and issues and to make explicit recommendations for action. In the process, common interests and goals among participants are discovered. This discovery has, time after time, led to the development of partnerships and collaborations, either for the short- or the long-term.

There are many ways for zoos as well as other organizations to form partnerships and collaborations for conservation, and CBSG-facilitated avenues are only one. For zoos, CBSG can help to facilitate linkages leading to partnerships, with several advantages.

CBSG conducts workshops only at the request of in-country bodies responsible for the management of the species or area in question. Thus, for projects with species or areas of interest, CBSG is the initial contact. We generally try to link up interested zoos with workshops on topics, species, or areas of special relevance to their collection or philosophy. If an interested zoo also decides to provide financial support for a workshop, then that support is acknowledged on all publications resulting from the workshop process. This provides a two-sided advantage for zoos and other institutions: 1) it sends a clear message to field and wildlife personnel that an organization is interested in field conservation and the management of wild populations in addition to any existing captive populations; and 2) it makes a strong statement to organizational Boards of Directors and an organization's own local and national constituency that it is supporting scientifically and collaboratively developed conservation and management programs developed in range countries by range-country experts. Possibly most important are the local connections that can be facilitated through face-to-face encounters with the in-country experts.

Some of the advantages in these local connections are that staffs of participating zoos or organizations have an opportunity to directly interact with in-country biologists and managers during the workshop process. Because they are part of the process, staff can make first-hand assessments of emerging projects of interest in line with the mission of their institution and can meet with local participants who can implement them. Finally, these processes facilitate connections with local wildlife agencies or governmental officials participating in the meeting, which also can facilitate *in situ* work.

Like any good relationship, conservation partnerships are based on trust. There is no substitute for face-to-face discussion in overcoming some of the very basic, universal human characteristics such as mistrust of outsiders and territoriality. The following articles focus not only on the results of some recent CBSG workshop processes, but also on some of the linkages, partnerships and collaborations that have been catalyzed around particular processes. There are many ways to build partnerships -- the ones discussed here are examples of some that have been formed through CBSG and its network. Possibly the most important part for zoos and other institutions is that once CBSG assists in facilitating the partnerships, it steps aside unless asked to re-enter the scene. ■

Submitted by Susie Ellis, CBSG.

Benefits to Omaha's Henry Doorly Zoo from Participation in CBSG Processes

Omaha's Henry Doorly Zoo

Omaha's Henry Doorly Zoo has built a strong foundation of fundamental animal management expertise through long-term management of endangered species for conservation purposes. Active research has been a high priority for more than 20 years, ranging over diverse areas, including the development of innovative animal immobilization procedures and animal handling techniques. The zoo has also made long term investments in facilities and personnel to develop tools such as artificial insemination or the ability to sequence DNA. The zoo has actively participated in the development and implementation of regional programs for captive endangered species such as Species Survival Plans in the United States and international programs, such as the Global Conservation Strategy for tigers, since their inception. Zoo staff have built extensive international contact networks and worked directly with many of them on conservation programs in their zoos or regions.

As our participation and investment in these programs has grown, three issues in particular became apparent. The first issue is the need to convey to the zoo's local support network of members, society, volunteers and donors the importance of expending scarce resources on out-of-country research programs and the value of providing staff members accumulated expertise to address specific conservation situations. The second issue of concern is that while the zoo has historically participated in and contributed to many individual conservation programs, it was difficult to identify which projects would actually benefit the species and were likely to succeed in accomplishing their objective. The zoo has both directly experienced and observed other institutions experiencing the frustration of having programs fail for preventable reasons. Causes include insufficient planning, lack of current information or inadequate resources, lack of sufficient coordination of isolated programs with each other led to duplication of efforts, unforeseen conflicts, and occasionally neutralizing antagonism with other programs which rendered them ineffective. The third issue that arose on occasion was that nearly all of the programs that the zoo sought to participate in were geographically removed from our local area of the upper Midwestern United States. Although the value of the global programs was accepted by the zoo

support network, the valid question of what we were doing for conservation in our own backyard often remained unanswered in specific terms.

Collaboration with CBSG

The Henry Doorly Zoo has been an active participant in CBSG since its founding. Zoo staff members have participated in multiple CBSG processes when their expertise or knowledge was appropriate to the species involved. The processes that the CBSG has developed have provided a starting point for building a framework in which the zoo has been able to: 1) identify specific, participatory roles for the zoo within coordinated, progressive range country conservation programs; 2) identify specific conservation applications of both zoo staff expertise and conservation tools developed through research at the zoo; and 3) identify significant roles that the zoo can play in local endangered species conservation.

The primary benefit to the zoo is the global networking and collaborations we have developed with range country endangered species conservation programs. These programs, initiated, developed and managed within and by the range countries, provided a context in which the accumulated experience and expertise of many zoo staff members could be specifically applied to the resolution of issues affecting conservation of endangered species. This in turn has provided clear examples to the zoo support network of the benefits and value of committing zoo resources to help solve "real world" problems in conservation. Most of these projects have had defined objectives structured within an overall range country program which is well coordinated between agencies working with the species and was based on an up-to-date assessment of status, factors and available information. Consequently most of these projects have defined endpoints with clear conclusions that produce identifiable results. Participation in several of the CBSG workshops led to the realization that the processes in fact could be applied to a local endangered species conservation issue in our own "range country" of Omaha, Nebraska, USA and the surrounding region. Subsequently the zoo played a significant role in the organization of a PHVA in Nebraska for an endangered plant species, the Western Prairie Fringed Orchid (*Platanthera praeclara*). One of the results of this PHVA was that the zoo identified a significant role that it was uniquely equipped to play in the conservation of this species both locally and nationally.

Wild Cattle Workshops and Programs

The Henry Doorly Zoo has participated in many CBSG workshops including CAMPs or PHVAs for gibbons, hornbills, tigers, the black-footed ferret, and the Javan hawk-eagle as well as wild cattle species. Most of these have yielded beneficial results and many have resulted in ongoing programs in which the zoo participates. The series of processes involving wild cattle species is the most traceable line that has produced the clearest examples of the outcomes described above. It is important to note in this context, however, that the cumulative experience, programs, and contacts developed from participation in all of the processes for a wide range of species has served to reinforce and significantly influence the course of the line of wild cattle related events.

The Henry Doorly Zoo has managed gaur (*Bos gaurus*) on site for more than 30 years and the current zoo staff have accumulated significant experience and knowledge through the day-to-day care of the species, through direct animal management for conservation purposes, and through the coordination and genetic management of the regional gaur population. The zoo director is the North American coordinator for the species and has been active in the international management of the captive population as well as in programs for other wild cattle species such as anoa and kouprey. Zoo staff have worked on the development of practical, safe methods for the routine chemical immobilization of the species and for physical restraint of individuals without tranquilizers or anesthetics. Approximately 12 years ago the zoo initiated a research program focused on developing assisted reproduction and genome resource banking techniques for the species to improve our ability to preserve the genetic diversity. These research programs have resulted in the first gaur produced by artificial insemination and the first gaur produced by *in vitro* fertilization as well as the establishment of a Genome Resource Bank with over 14,000 samples of cryopreserved semen from genetically valuable male gaur in North America. These research programs have always been collaborative with multiple institutions. The zoo staff is currently coordinating a multiple zoo project to develop these successful research protocols into useful day-to-day species management tools. The management and research programs with gaur as well as other species have resulted in publications that have contributed to the body of information for management and conservation of the species.

The zoo hosted a Wild Cattle Symposium in 1991, intended to bring together as many people as possible involved in reproductive research with wild cattle

species. Representatives from CBSG attended this meeting and assisted with working groups to address significant issues facing the application of assisted reproduction techniques to the conservation of wild cattle species. Two outcomes of this meeting were of particular importance for Omaha. The first was that it made a larger number of people who were working with assisted reproduction and conservation of wild cattle aware of the resource of experience and information that had been developed at the zoo. The second was that one of the contacts made at this meeting was significantly influential in the Omaha Zoos' participation in a gaur project in Nepal. In this project, a gaur immobilization protocol developed at Omaha was applied for the first time to free-ranging gaur in a field situation for radio-collaring and disease testing purposes. One of the collaborators on the project in Nepal subsequently invited zoo staff members to Thailand to apply the technique there and to train field researchers in the immobilization technique. Based in part on this training, Thai field researchers under the auspices of the Wildlife Conservation Division of the Royal Forest Department of Thailand then developed their own habitat utilization study of gaur and banteng (*Bos javanicus*) which relied on immobilization and radio-collaring of free-ranging animals.

The zoo's experience with animal management and collaboration with CBSG resulted in zoo staff members participation from 1991 to 1993 in a project of the Zoological Parks Organization of Thailand (ZPO) to help assess their entire organization and facilities and develop a comprehensive, state-of-the-art captive management program. This ambitious project produced a large number of positive outcomes for the ZPO. One of these was a collaboration with the Henry Doorly Zoo and National Zoological Park (USA) to assist the Khao Kheow Open Zoo in the development of their own assisted reproduction research program for wild cattle species. This broad program has included diverse aspects such as Thai zoo veterinarians coming to the Omaha Zoo for training programs in immobilization and assisted reproduction techniques, collaboration on immobilization and semen collection projects with gaur and banteng at Khao Kheow, and construction of a wild cattle animal handling and research facility at Khao Kheow.

As a result of Omaha's commitment to and interest in wild cattle, staff members participated in the Wild Cattle CAMP in Thailand in 1995. This CAMP assessed the status of the wild cattle species in Asia and developed priority lists of programs and projects needed to conserve *in situ* populations of the species.

The principal benefit of this workshop was the development of an extensive network of contacts with participants who were actively working on wild cattle conservation projects, a clarification of which species seemed to be confronted by the greatest threats, and an understanding of what needed to be done to prevent their extinction.

As a direct result of participation in the Wild Cattle CAMP, staff members participated in the PHVA for the tamaraw (*Bubalus mindorensis*) at the University of the Philippines Los Banos in May 1996. This valuable workshop defined and prioritized the significant issues affecting conservation of this species and identified multiple projects to address these issues. One of these projects was the evaluation and further development of the captive breeding program at the Tamaraw Conservation Program (TCP) facility on Mindoro Island in the Philippines. As part of that development, Omaha Zoo staff participated with staff members from White Oak Plantation and range country staff, all working with the TCP, in a technology transfer program in May 1997. The direct outcome of this program was that the first immobilization of a tamaraw with carfentanil was successfully carried out and semen was collected by electroejaculation to establish the beginning of a Genome Resource Bank for the tamaraw.

The Wild Cattle CAMP also led directly to participation in the anoa workshop (*Bubalus quarlesi* and *B. depressicornis*) held at Taman Safari in Indonesia in July 1996. During this workshop the question of whether or not there are two true subspecies of anoa was debated, with the answer having important implications to both *in situ* and *ex situ* conservation programs. The Omaha Zoo's genetic staff and DNA sequencing lab emphasizes work on cattle species and has access to a large library of unique cattle specific probes through the professional contacts of our staff geneticist. Consequently the zoo was able to provide this service to address the subspecies issue. To date, samples representing both subspecies have been received from several captive animals at Taman Safari and are being analyzed. More samples from anoa at other Indonesian zoos have been collected, and additional sampling may be done in order to provide a sufficient sample size to resolve this issue.

The Omaha Zoo was able to further provide support to the tamaraw and anoa projects with \$90,000 contributed specifically for these two projects from local zoo supporters with business interests in the Philippines and Indonesia.

Local Conservation Programs

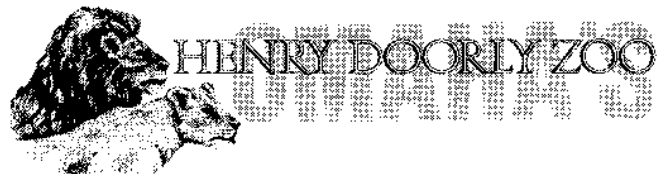
These projects are all located in areas geographically removed from Omaha, Nebraska, USA where the zoo is located. While we had participated in some conservation programs for North American species, most notably the black-footed ferret which was historically a native species in western Nebraska, we were not involved directly in conservation programs in our immediate area. Although the zoo had an interest in participating in local conservation programs, no particular needs in local programs or areas of expertise that the zoo could contribute had been identified. Approximately three years ago the zoo established a rudimentary *in vitro* plant micro-propagation laboratory as part of our expanding research interests. Through this work we became more familiar with endangered plant species and their conservation, in particular an endangered orchid species native to and still found in the Omaha area, the western prairie fringed orchid. This orchid is in decline in Nebraska and is affected by a wide variety of factors.

A number of groups in the area, including state and federal agencies, were involved in conservation programs with the species. A number of other stakeholder groups, such as ranchers, directly affected the orchid's survival and were in turn directly affected by conservation programs for the species. As we became more familiar with the situation for this species, the sum of our experience with multiple CBSG processes in a wide range of species indicated that a PHVA for the orchid in Nebraska might be of benefit to the species. Consequently the zoo approached the Nebraska Game and Parks Commission (NGPC) about the possibility of organizing a workshop for the species. They responded positively and the zoo worked with NGPC to hold the workshop in April 1997 at the Eugene T. Mahoney State Park near Ashland, Nebraska. One significant issue that was identified was the extensive fragmentation of the Nebraska population, including the plants near Omaha, and the significant distances between those populations. These factors may have resulted in isolated populations with reduced genetic diversity and reduced survivability. The zoo's genetics lab was identified as a unique local resource particularly well equipped to do the genetic assessments of these plant populations. As the project developed, conservation programs in adjacent regions also sought to participate. To date, samples have been received from populations of the plant in five Mid-western states and from Canada. This project has developed rapidly.

Conclusion

Participation in CBSG processes has provided the Henry Doorly Zoo with the opportunity to identify significant, contributory roles in progressive range country conservation programs for the preservation of endangered species. The zoo is able to make contributions to these programs drawn from the accumulated experience and expertise of the zoo staff in the form of advice, technology transfer and laboratory support. Development and successful execution of projects in these programs requires persistent investments of time and effort by all collaborators involved. The programs provide the zoo with specific examples of the successful application of zoo staff expertise and of zoo research programs to conservation both locally and internationally. These examples have increased the understanding by the zoo's support network of the value of the zoo's participation in these programs and have helped to increase support for the zoo and its activities. Evidence of this increased support can be measured in the significant direct financial support contributed from within this network. CBSG processes often provide the starting point for projects and create an initial environment in which valuable collaborations develop into conservation actions. Projects to accomplish goals identified during CBSG processes are usually pursued independently of CBSG, are always based on the participants' assessment of what needs to be done, and are entirely dependent on the initiative, effort and resources of the parties involved to get the job done. ■

Submitted by Douglas Armstrong, Lee Simmons, Daniel Morris, Dan Cassidy, Naida Loskutoff, Corrine Brown and Ed Louis, Henry Doorly Zoo, Omaha



Partnerships and Conservation Initiatives Resulting from Tamarin PVA Workshops

Introduction

In the evolution of coordinating interactive management between captive and wild populations, the CBSG Population Viability Assessment (PVA) workshop for the genus *Leontopithecus* held in Belo Horizonte, Brazil in June 1990 represented a significant landmark in formulating management scenarios for all four species of lion tamarin (golden lion tamarin *L. rosalia*, golden-headed lion tamarin *L. chrysomelas*, black lion tamarin *L. chrysopygus*, and black-headed lion tamarin *L. caissara*).

The PVA was organized to combine available information on the biology and status of these species with analytical techniques to evaluate their conservation implications. The broad sponsorship, presence of fieldworkers, agency officials, support organizations and scientists, and the strong local support led to the meeting's success.

The overall purpose of the *Leontopithecus* PVA was to develop a Conservation Strategy to assure, with high probability, the continued survival and adaptive evolution of each of these four species. This paper describes how partnerships and meaningful initiatives for the conservation of *Leontopithecus* resulted from the June 1990 Belo Horizonte Workshop.

History in Captivity

Concern about lion tamarins began in the early 1960s when Brazilian primatologist Ademar Coimbra-Filho called attention to the severe plight of the golden lion tamarin in the state of Rio de Janeiro. During the 19th and 20th centuries many golden lion tamarins were exported for the pet trade, zoos and research. By the 1960s their numbers had decreased dramatically due to both exportation and deforestation.

After the 1972 'Saving the Lion Marmoset Conference', the National Zoological Park in Washington, DC, social behavior, veterinary care and husbandry of the golden lion tamarin in captivity. Application of research results on captive management and breeding resulted in the dramatic expansion of the captive population from about 70 individuals in fewer than 20 institutions in 1973, to nearly 600 individuals by the mid-1980s. Due to the great success of the scientific management of the global captive population of the golden lion tamarin, there are currently approximately 490 individuals being managed at zero population growth in over 143 zoos.

Golden-headed and black (golden-rumped) lion tamarins were less known than the golden lion tamarin species. Indeed, in 1970, after an interval of 65 years during which the black lion tamarin had not been seen, Coimbra-Filho rediscovered the species in the state of São Paulo. At that time, there were no records of the species having been maintained in captivity, and Coimbra-Filho was the first to breed the species.

The only record of golden-headed lion tamarins in captivity before this century was at the London Zoo in 1869, but specimens were exhibited in Rio de Janeiro in 1961. From 1971, Coimbra-Filho housed them at what was to become the Rio de Janeiro Primate Centre (CPRJ-FEEMA), founded by him for the breeding of endangered species of Brazilian primates. The black-headed lion tamarin, only just discovered on the island of Superagui (Paraná state) in January 1990, has not yet been held in captivity. Prior to 1980, there were no long-term field studies of the ecology and social behavior of any of the lion tamarins.

Current Wild Status

The four species of lion tamarins, which are all endemic to the Atlantic coastal forest of Brazil, are extremely endangered, with very small and disjunct distributions, resulting from the widespread and continuing destruction of Atlantic forests. Populations today are minimal and very highly fragmented.

The golden lion tamarin is now restricted to lowland forest patches in four municipalities in the state of Rio de Janeiro, with the majority found in forest fragments which have been isolated for more than 15 years. The golden-headed lion tamarin has been recorded in over 100 localities in the state of Bahia but due to its relatively low density and the current rate of forest destruction and degradation, they are considered highly vulnerable to population extinction. The black lion tamarin is known from five localities in the state of São Paulo. The black-headed lion tamarin is restricted to part of the Island of Superagui, off the coast of the state of Paraná, and has recently been reported in a small area of lowland forest on the continent northeast of Paraná and São Paulo.

Tamarin PVA Workshops

The four lion tamarin species are in different situations regarding their status in captivity and in the wild. PVA analyses have channeled and oriented conservation efforts over the last few years, and are a fundamental tool when dealing with reduced and fragmented populations which demand active management. One of the most important results of 1990 PVA workshop may have been that the PVA analyses have

formally refuted the prospects for long-term survival of the populations in the various protected areas. This discouraged complacency with regard to their protection and management and the creation of further conservation units.

The Brazilian Institute for the Environment and Renewable Resources (IBAMA), Brasilia, and the Fundação Biodiversitas, Belo Horizonte, organized the second lion tamarin workshop which was held in Belo Horizonte in May 1997. The main aim of the PHVA workshop was to review the data available for each of the four species in order to evaluate progress since the 1990 workshop on captive and wild populations and to elaborate on management plans and proposals for continuing conservation efforts.

Four working groups were established concerning the following issues: habitats/protected areas/wild populations/research; metapopulation management; communication; and computer simulation modeling. It was the task of each working group to list, prioritize and describe the problems/issues affecting the conservation management of the species, and to also list and amplify 3-10 strategies or actions that might improve each of the priority problems/issues. Several brainstorming sessions also took place concerning the overall issues, problems and topics affecting the conservation and management of lion tamarins.



Discussion

The following events are considered of particular significance regarding the main partnerships and conservation initiatives resulting from the first PVA.:

Establishment of Management Committees

This represents the first time that a government has recognized International Research and Management Committees (IRMCs) as technical advisers on both the *in situ* and *ex situ* populations of endangered species. The IRMCs meet annually with the governmental conservation agency to discuss progress.

Title of Managed Populations

This is the first time that the title to all individuals within a genus that form part of the international scientifically managed populations, and listed in the international studbooks, are owned by the people and government of the country where the genus is endemic.

Lion Tamarins of Brazil Fund (LTBF)

This is the first time that an international fund has been established whereby all holders of specimens held outside the range country are requested to contribute annually to a fund to aid the conservation of the remnant wild populations. Since the LTBF's inception in 1991 the Fund has raised in excess of US\$100,000 in support of *in situ* conservation work.

With our growing understanding of the science of conservation, the work of the Leontopithecus Committees highlights how well the adoption of 'flagship' species and publication of the plight of remnant populations in depleted environments can promote public attention and support, culminating in the preservation and conservation of both animal species and associated habitat. PVA analysis, used as an ongoing process of perfecting the database and as a means of providing a consistent and periodic re-evaluation of conservation status, has proved to be an important tool for guiding the conservation measures and research priorities for the four lion tamarin species.

The lion tamarin programs have accumulated a great deal of data and can therefore demonstrate what can be achieved through scientifically coordinated programs and partnerships. The reintroduction program for *L. rosalia* has resulted in a 38% increase (2,300 ha) of protected Atlantic coastal forest in the state of Rio de Janeiro. International and Brazilian NGOs have raised sufficient funds to increase the Una Biological Reserve in the state of Bahia (which represents the only protected area for *L. chrysomelas*) by 32% (2,300 ha). The coordinated work of the

international committees has been integral to the overall success of aiding both species survival and habitat preservation. These programs represent excellent examples of what can be achieved through a multidisciplinary approach involving science, interactive management, politics, environmental education, habitat preservation and restoration.

The 1997 *Leontopithecus* PHVA built upon the findings and work of the 1990 workshop. An up-to-date analysis of the population size and amount of habitat necessary to minimize long-term extinction risk for the four lion tamarins has been produced. This will guide conservation action over the next few years.

The Golden Lion Tamarin Conservation Program has been working to save this species and the Atlantic forest for 25 years. The program acts as a model from which other conservation programs can learn and on which other conservation actions can be based. The next few decades will determine whether or not the PVAs and concerted actions of all those involved with the conservation of Brazilian Atlantic forest will be sufficient to ensure its continued existence.

In conclusion, much of the significant progress made to date has resulted directly from the CBSG PHVA workshops. It is therefore hoped that continued multi-disciplinary conservation partnerships will not only conserve the viability of the four lion tamarin species, but will also help to preserve the unique and threatened Atlantic forest ecosystem well into the next millennium and beyond. ■

Submitted by Jeremy Mallinson, Jersey Wildlife Preservation Trust.

Assessment of Chimpanzee PHVA



The process of developing a PHVA in Uganda came by a very circuitous course. In 1996, I was in the process of ascertaining how to accurately assess the chimpanzee population in Uganda and what conservation action to recommend to the Uganda Wildlife Authority and the Department of Forestry. It occurred to me, after having attended an orangutan PHVA in Medan, that a PHVA workshop might be a more structured and accurate methodology to assess the

Ugandan chimpanzee population and develop a very cogent conservation plan.

After consulting with CBSG, a proposal was submitted to the Ugandan Wildlife Authority and the Department of Forestry. Once all approvals were made, it became obvious that there must be a project leader who represented CBSG and the Ugandan government. I agreed to undertake this special role.

To insure the success of the workshop, the top researchers in Uganda and other scientists who conducted chimpanzee research in East Africa were invited to attend. Jane Goodall, Richard Wrangham, Vernon Reynolds, William McGrew, Caroline Tutin, Andy Plumptre and Craig Stanford all agreed to be part of the PHVA process.

The rapid decline of the African chimp population and major fragmentation has created a number of conservation problems. One problem is the reduced capacity for natural exchange among these isolated populations, which increases the chance of extinction. Other problems relate to tourism, captive population and how to deal with the sanctuary programs. Development of a detailed research and conservation action program for *Pan troglodytes schweinfurthii* has been restricted due to lack of detailed information.

After completion of the PHVA workshop, all of the above mentioned issues resulted in a comprehensive action plan for the Uganda Wildlife Authority and the Department of Forestry. A return trip to Uganda was made in May 1997 to present to the proper authorities the final report and assist them in developing a timeline to implement all of the key recommendations.

Some of the benefits of this PHVA:

1. A model for other chimpanzee populations where problems are very similar to the chimps of Uganda;
2. The success of the workshop acted as a catalyst to convince the scientific community of the importance and values of the PHVA process;
3. The creation of strong bonds with National Parks and the Forestry Department.

The real litmus test was the fact that Uganda Wildlife Authority invited CBSG to conduct a mountain gorilla PHVA in December 1997. Both the chimpanzee PHVA and the mountain gorilla workshop are a first for these great apes in Africa.

In summary, the results of the chimpanzee PHVA were positive and illustrate that if all guidelines are followed for a PHVA workshop and the organizing group strives for success, there is no reason why future workshops cannot meet all their complex goals. ■

Submitted by Norm Rosen.

Mesoamerican Felid CAMP

Wild populations of felids in Mesoamerica are in peril. Mesoamerica provides native habitat to seven wild cat species, including the puma (*Felis concolor*), Jaguar (*Panthera onca*), jaguarundi (*Herpailurus yagouaroundi*), ocelot (*Leopardus pardalis*), oncilla (*Leopardus tigrinus*), margay (*Leopardus wiedi*) and bobcat (*Lynx rufus*). Of these, only the bobcat is considered secure from the risk of extinction.

The primary problem in conserving Mesoamerican felids is a lack of knowledge about the status and ecology of wild cats and how they should be managed in the wild and in zoos. To begin to address these challenges, a 5-day workshop was held at the Simón Bolívar Zoo in San José, Costa Rica on 7-12 April 1997. Participants included 80 felid specialists representing nine countries in the region, including Panama, Mexico, El Salvador, Costa Rica, Belize, Guatemala, Cuba, Mexico and the Dominican Republic (see *CBSG News*, Vol. 1, No. 1 for details).

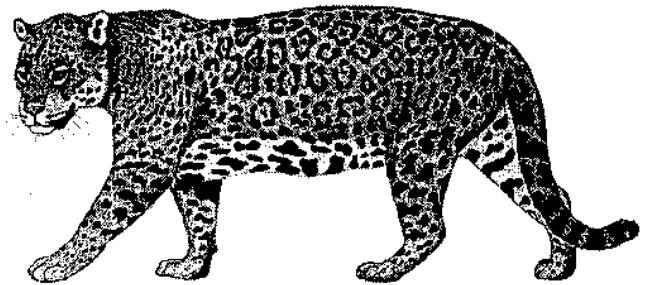
The genesis of this meeting was the original CAMP workshop jointly held by CBSG and the AZA Felid Taxon Advisory Group (TAG) in Front Royal, Virginia, USA in 1991. At that workshop information was compiled on the conservation status of the world's cats and high priority management needs were identified. Although a great deal of information was generated, important information from specialists in the range regions was lacking. One outcome of that effort was a Regional Felid CAMP workshop held in Brazil in 1994 that amplified the information base for felids endemic to South America.

Yolanda Matamoros, Director of the Simón Bolívar Zoo and President of the Mesoamerican and Caribbean Zoo Association (AMAZOO), approached CBSG and Felid TAG staff about hosting a regional felid workshop for all of Mesoamerica, as felids are a priority group for AMAZOO. The goals of the workshop were to refine existing CAMP data and recommendations as well as address issues relating to Mesoamerican felids in nature and zoos, and also in terms of education, training and the development of a regional network. Generous support was provided by the U.S. Fish and Wildlife Service, Columbus Zoo, Oklahoma City Zoo, National Zoological Park's NOAHS, Fort Worth Zoo and San Diego Zoo.

Eighty participants from nine countries attended the CAMP workshop. Emphasis was placed on sharing all available information, reaching agreement on issues and then making practical recommendations for action. Brief, daily plenary sessions were followed by individ-

ual working groups. Short lectures were provided by specialists on topics relevant to workshop recommendations. A second meeting was held between 30 June - 2 July to review the taxon data sheets and group recommendations.

The principal initiatives started through this workshop are the species studbooks and the network of specialists. All participants had the opportunity of sharing their experiences and also starting or renewing friendships.



FUNDAZOO and AMAZOO are integrally involved with CBSG, as we see many benefits from this relationship:

- For the Zoo: This allows us to meet the conservation goal of the institution; make friends for the zoo, as more people know our work; train our personnel; increase media coverage; and encourage people to think of us as a real conservation institution.
- For FUNDAZOO: Meets its conservation goal.
- For Costa Rica: Provides an analysis of conservation problems and solutions.
- For the Region: Provides an analysis of species status and solutions to problems.
- For AMAZOO: Meets conservation goals; starts conservation actions; initiating studbooks; and identifies flagship species.
- For Yolanda Matamoros: Growing in knowledge, experience and friends. ■

Submitted by Yolanda Matamoros, Simón Bolívar Zoo.

A Stranger in the Midst: Promise and Limits of Conservation Education

In the course of this presentation, I will attempt to clarify what conservation education can and cannot do, discuss the realm of possibilities for joint endeavors between biologists and educators, and reflect on some of the more difficult decisions facing us all.

Before I ask you to consider whether or not education should be one of the armaments in the conservationist's arsenal, I will define what I mean by conservation education. There is no standard definition; consequently, I will ask you to consider the definition we use at the Wildlife Conservation Park in New York. *Education is a process of developing in learners special abilities of the mind.* One of the basic results achieved by education is the imparting of knowledge. But a more ambitious outcome is developing in learners a mode of thought and feeling, an aspiration toward – and an appreciation of – high intellectual, moral and aesthetic ideals. When these outcomes are directed toward the preservation of particular species, or nature in general, we refer to it as conservation education.

It might be helpful if I elucidate the definition a bit further by providing some examples of the results we expect to see in people who have been the targets of effective conservation education programs. On the most basic level, the educator's job is to ensure that people attach positive value to animals and natural habitats. Just because you and I think that wildlife is essential to the future of life on our planet, there is absolutely no reason to assume that most of the world's people feel as we do.

Indeed, for most of the people of the world, thoughts of daily personal survival are paramount. The plight of species is as remote as Mars. Only well orchestrated campaigns by educators can bring wildlife into the forefront of people's consciousness. Once we achieve the awareness, it is important to provide a good basic understanding of ecological processes. How can we expect people living near nature reserves, for example, to support protective measures for predators if they fail to understand the relationships between predators and prey, the significance of carrying capacity, or the role of human intervention? Since most people do not understand how nature works, they cannot appreciate or support what you are attempting to accomplish.

The ability to make wise choices is another essential outcome of conservation education. Whether it is a choice of how to use a protected area, how to allocate one's vote, which product to buy, which organization to join, where to contribute money or which mode of transportation is least destructive to the environment, conservation savvy decisions by the world's citizens and consumers are vital to ensuring that your work has lasting results.

Without your efforts many highly endangered species will not survive. Some will not survive even despite your best efforts. Without public education, however, in the long term, none of them will survive.

Take a country like China, for example. With a vast population poised to plunge into a capitalist buying frenzy, the free rein of consumer habits – particularly given the huge Chinese market for animal products – could decimate a number of severely endangered species in the absence of a comprehensive conservation education effort. "Education is a time consuming process," you may be thinking, "Even if you start with young children whose attitudes are still malleable, it will be years before they have any impact." But commonly held assumptions do not always hold true. Consider these stories from teachers in China's Yunnan province whose students participated in the Wildlife Conservation Society's education program last year:

"There is a student in our school whose family just got four soft-shelled turtles - three alive and one already cooked. The student didn't allow his family to eat the cooked one and wanted to give the other three to me. After talking to me, the parents said they would give the shell of the cooked one to the school to make it into a study specimen and that they would free the rest of the turtles. I don't know whether they freed them or not, but they did give me the shell of the cooked one and I still have it. Therefore, I feel in the two years I used your curriculum, it has had great impact on the students that cannot be underestimated."

A vivid example of a budding conservationist is as follows: "A seven year old student saw a coat his mother wore which was made of the red panda's fur and told her "You're breaking the law! You're helping those who killed the wild animals to dispose of stolen goods!" His teacher writes : "Although the words he used are not very proper, it shows that the Pablo Python1 course is changing my students' attitudes."

A final example of the power of conservation education. "One day a child brought a snake into our school. The students who are not in the program said they should kill the snake because it would bite people and be harmful. But the students in the program

disagreed and the two sides had a heated argument. Finally they came to the teacher to decide. The teacher writes of her students, " At this moment I knew that the seed of awareness about environmental protection had been planted in their souls."

The goal of our collaborative program with the Chinese government, arranged through its State Education Commission in Beijing, is to affect local, regional and national attitudes about wildlife, natural habitats and conservation. To date 10,000 students have been reached in the pilot phase of the program and a major expansion into four provinces is underway. Ultimately, changes in attitude and resource consumption are essential to the preservation of wildlife in the Far East and the rest of the world. The program we have been conducting in China for the past four years was initiated by conservation biologists who point to new ways of thinking about conservation education. By working jointly with Wildlife Conservation Society scientists and China's Kunming Institute of Zoology our educators have been able to provide teachers with the methods, materials and knowledge necessary to undertake meaningful conservation education in the schools.

Our objectives include increasing appreciation for the value of wildlife and habitats throughout Chinese society. The teachers we have trained will, in turn, educate their peers about the relationship between the decline of species in their natural habitats (both within China and throughout the rest of the world), and the Chinese market for wildlife products. Ultimately, our goal is to prepare Chinese educators and community resource agencies to assume management of their own environmental education programs. Our China program provides a useful model of adapting proven conservation education programs to foreign contexts where critical conservation needs exist.

The Wildlife Conservation Society's China program did not spring full-blown out of a void. It followed a succession of pioneering programs in the international conservation education arena. As early as 1987 we were invited by the Ministry of Education in Belize, Central America, to introduce W.I.Z.E., our comprehensive conservation curriculum for the middle schools to educators from more than 40 schools in areas ranging from remote Mayan villages to downtown Belize City.

The U.S. Agency for International Development funded a comprehensive evaluation to help us assess the program's cross-cultural relevance. The resulting studies affirmed that ecological principles hold true whether they are taught in the tropics, or in deciduous forests. Children's developmental patterns and their

ability to comprehend biological principles remain the same the world over. Teachers from every walk of life experience the same joy in discovery and in shaping young minds. In short, whether it is done on site at a zoo, in a school classroom, or in the field, conservation education works.

Following the successful implementation of the Belize program, we opened the doors of our annual summer teacher training institutes to wildlife professionals from zoos, parks and reserves all over the world. Many participants are referred to us by our field biologists working abroad. Once we ascertain that the candidates have a viable plan for follow up activities and can secure travel support, our Education Department waives all training and materials fees, and often underwrites housing costs. In this fashion we have trained conservation educators from well over a dozen countries from Sierra Leone in Africa, to Brazil in South America and many others. In some cases the trainees are not, in fact, educators.

Occasionally we train biologists who feel that a conservation education program in their region would help generate local support for their work. Few come away from the experience unconvinced that education is a powerful conservation tool. Many see immediate results. During the staff retreat I mentioned earlier, one of our field biologists working in Peru began expressing his skepticism about the bottom-line effectiveness of conservation education. Then, another working in India recounted how a program to deter poaching led local high school age students in his region to turn in suspected poachers.

One of the greatest satisfactions of working with staff members from developing countries is witnessing the creativity with which they apply the educational principles taught in our training institutes to their local situations. One Brazilian participant, for instance, had our ecology curriculum translated into Portuguese and used it as the basis for a series of radio broadcasts throughout the Amazon. Another from Cameroon developed a play to be performed by high school students for their community. Still another created a participatory exhibit for a local zoo.

From what I have said so far, you have probably understood that I am a strong proponent and believer in conservation education. Whether it is done on site at a zoo, in a school classroom or in the field, it has definitely proven its value. The recent strong grassroots support for environmental policies in the U.S. has often been linked to introduction of environmental education mandates in most states some years ago. And conservation education is environmental education with a strong focus on wildlife.

So, is education the answer for species tottering on the brink of extinction? Is it the panacea I might have suggested it is? The simplistic answer is – probably not. But simple answers suffice only for simple questions. Perhaps these aren't the right questions at all. Perhaps the more relevant question is: can we afford to fail in teaching the next generation about issues pertinent to species survival and the intricacies of ecology? For if we fail, who will protect the species, the programs, the protected areas and the zoos in which we all work? Maybe the Sumatran rhino cannot be saved by education, but perhaps a somewhat more abundant species can, as the population of educated citizens grows.

Of course, even once the fundamental questions are properly framed, conservation biologists and educators are facing some very real dilemmas. There is not enough time, money, staff or real expertise to accomplish our ambitious goals. Money and staff are two particularly thorny issues. This is especially true for an organization such as CBSG whose staff is so small. A number of leading figures in captive breeding circles have raised the very worthy question of whether CBSG can afford to divert its energies toward any educational endeavors. This is a question which I am not prepared to address, but one that would be useful for the attendees of this meeting to consider.

Quite possibly the answer lies in building stronger alliances among conservation biologists and educators. As a representative of the International Zoo Educators association, I have been asked to chair Sci-Net's education group. I am looking forward to meeting with many of you to discuss productive links between our two communities of experts. It has been my experience that international networking can be very useful.

In 1990 I chaired the First Pan American Congress on Conservation of Wildlife through Education in Caracas, Venezuela. The Congress was co-sponsored by the Wildlife Conservation Society, the International Zoo Educators Organization and the Venezuelan government. It marked the first time educators and biologists in the western hemisphere had gathered to consider education as a primary tool for conservation. Representatives from 163 different types of organizations and 28 countries examined priorities and assumptions in conservation education, came up with guidelines for effective programs, and shared strategies for success.

By interacting with one another participants worked to develop more effective strategies for fostering conservation actions. They forged links among institutions that had not worked together previously and initiated cooperative working relationships which

continue today. Educators learned first-hand some of the knotty problems the scientists had to solve and became better equipped to communicate them to their audiences. The biologists, in turn, gained respect for the creative teaching strategies employed by the educators and began to rely on them more to carry a message about their work to the public at large.

As a result of numerous requests to perpetuate the event, a second Pan American Congress is being planned for Spring 1998. This time, however, we will save precious resources by conducting the congress over the Internet. If any of you are interested in joining the dialogue on how we can work together to create an amenable climate for the species which are being bred today, please contact me with relevant mail and e-mail addresses.

In closing, let me summarize the realm of possibilities for some joint endeavors. First we should have an exhaustive dialogue on whether or not it makes good sense to develop individualized education programs for the SSPs, TAGs and FIGs as some are attempting to do. Next we should discuss which species, if any, could benefit from intensive education campaigns. At the WCS we are testing this approach with a major program on tigers, which we hope to translate and use in all the tiger range states. Perhaps it would be useful for scientists and educators to agree on some common regional conservation themes and to develop these into region-specific education programs.

A discussion on how we can avoid reinventing the wheel would also be essential. There seems to be too much unnecessary duplication of efforts, driven by institutional or national egos. Conservationists should not tolerate any waste of funds. We might also look at a system for identifying effective local models of conservation education and consider ways of transplanting these ideas through effective wide-scale dissemination. Our field does not have any such mechanism currently. A final suggestion might be to examine our target audiences. It seems that with time limitations and massive human population pressures we should start being much more selective about who should be educated. Contrary to most educators' instincts, not everyone should be targeted for conservation education programs. It would be enormously helpful if we could all agree on at least some of these issues. ■

Submitted by Annette Berkovits, Wildlife Conservation Society.



Proposed Breeding Facility for the Ethiopian Wolf

The Ethiopian wolf (*Canis simensis*) is the rarest canid in the world, found only in a few isolated mountains of Ethiopia. Loss of habitat, habitat fragmentation and persecution by pastoralists were the main causes for the decline of the wolf population to fewer than 400 individuals. The small size of the remaining populations have resulted in new threats, such as inbreeding, loss of genetic diversity and those arising from sympatric populations of domestic dogs, i.e. competition, disease and risk of hybridization. Thus, each of the remaining populations could become extinct soon. Ethiopia and the world stand in extreme likelihood of losing the species if action is not taken soon.

The Ethiopian Wolf Action Plan recently published by the IUCN Canid Specialist Group (CSG) addresses the species' current status and distribution, genetics, disease epidemiology and control, population viability analysis, afro-alpine habitat conservation, captive breeding and metapopulation management. The action plan summarizes conservation actions needed and lists proposals for a suite of different projects. With support from the Born Free Foundation and several other donors, CSG is coordinating the "Ethiopian Wolf Conservation Programme", a recovery program for this critically endangered canid which is already implementing a domestic dog vaccination campaign, a community education campaign, and monitoring of the remaining wolf populations.

In view of the persisting human impact and species vulnerability to extinction, the establishment of an in-country captive breeding facility is proposed. The goals of the facility will be to create an additional, genetically pure, wolf population, safe from the threats faced by wild populations. It will be an insurance program for the continuity of this endangered species regardless of crises in its natural habitat, and will produce founders for eventual release into the wild in reintroduction programs. Advantages of in-country programs include the establishment of semi-natural enclosures, availability of natural food, reduction of exposure to unfamiliar diseases, development of local wildlife management expertise, and the establishment of the Ethiopian wolf as a flagship species for afro-alpine habitat conservation.

A detailed plan has been developed for the construction of a captive propagation facility in Ethiopia, and the capture, holding, transport and housing of Ethiopian wolves in order to establish a

Nucleus I captive population. While the species has not been held in captivity for any length of time, experience with other canid species in captivity shows them to be very tolerant to captivity and genetic manipulation. The implementation of these proposals will be dependent upon development of funding, choice of location, and government approval. Imperative to the whole program is the continued maintenance of the species' natural habitat. Captive propagation will enhance the role of the Ethiopian wolf as a flagship for the afro-alpine ecosystem through an education center at the site.

Copies of this proposal and of the Ethiopian Wolf Action Plan may be obtained from the author. ■

Submitted by Claudio Sillero Zubiri, Ethiopian Wolf Conservation Programme.

Status and Future of the Baiji and Finless Porpoise

The baiji, *Lipotes vexillifer*, is one of five freshwater dolphin species and the most endangered cetacean species in the world. Found only in the middle and lower reaches of the Yangtze River in China (about 1,600 km), this population may be down to fewer than 100 individuals.

The finless porpoise, *Neophocaena phocaenoides*, is another small cetacean species of the Yangtze River. Primarily an oceanic cetacean species, a distinct freshwater subspecies lives in the middle and lower reaches of the Yangtze River, sharing the same habitat with the baiji. Its population size was estimated to be approximately 2,700 individuals, based on the survey results done before 1991, but has been decreasing remarkably in recent years.

Threats to Survival

The main threats to the survival of the baiji and finless porpoise stem from human activities. From specimens obtained from the Yangtze River since 1978, over 95% of known deaths of baiji were directly caused by human activities. Those human activities include:

Overfishing: It is believed that fish populations of the Yangtze River have been decreasing remarkably because of overfishing and degradation of the habitat in recent years.

Incidental capture by fishing: More than 60% of the known baiji deaths were caused by several different kinds of fishing gears, such as rolling hooks, electric fishing, and fishing by explosion.

Accidental deaths by traffic: The Yangtze River is the most important inland transportation channel in China. Traffic in the river has been increasing very rapidly along with the development of the economics of China. Propellers of ships sometimes kill baiji, especially in dry season of the river when the ship channel is relatively narrow. Explosions used to clear the ship channel also kill dolphins. In 1974, a group of four baiji, including two pregnant females, were killed by an explosion in the lower reaches, and one female adult baiji was killed last year in the middle reaches.

Degradation of habitat: The increasing construction of dams and floodgates on the mainstreams, tributaries, and connected lakes not only blockade connections between bodies of water for fish migration, but also destroy the ecological environment which is favorable for dolphins and porpoise.

Conservation Action

The first international freshwater dolphin workshop was held in 1986 at the Institute of Hydrobiology in Wuhan. At this workshop, we proposed three measures to protect these two species, based upon surveys we conducted over almost ten years: 1) set up natural reserves to protect the animals in nature; 2) set up semi-natural reserves to protect the animals in some areas with a similar environment to the main stream of the Yangtze River; and 3) intensify breeding research in captivity.

Some progress has been made for the conservation of these two species in recent years:

1. In 1992, two national baiji reserves were approved and established by the central government. One reserve, Shishou Baiji Semi-natural Reserve, was set up in a separated oxbow of the Yangtze River in Shishou of Hubei Province; the other, Xinluo Baiji Natural Reserve, was also set up in Hubei Province. A new baiji dolphin aquarium was set up in the Institute of Hydrobiology

2. Since 1990, several groups of the finless porpoise have been captured from the Yangtze River and introduced into the Shishou Semi-natural Reserve. They have been doing very well in the reserve, and are reproducing naturally.

Since the baiji population has reached such a low level, and the environmental conditions of the Yangtze River have been deteriorating due to increasing human

activities, baiji can hardly survive in the wild. However, a small population may be able to survive and breed in a semi-natural reserve. We believe that the semi-natural reserve is the best and may be the only hope for saving the baiji.

Even though the finless porpoise population is relatively healthier than that of the baiji, it is also decreasing rapidly. We should learn a lesson from the sad plight of the baiji. In order to avoid the difficult situations we have now for protecting the baiji, the program to establish a breeding group of the porpoise in Shishou Semi-natural Reserve should be intensified.

Problems

More needs to be learned about these two animals' social structures, social behaviors, movement and reproduction. A catalog of the individual dolphins should be compiled as soon as possible.

Live capture of baiji, which is the most important and necessary step for saving this species, is very difficult.

Little is known about the relationship between baiji and the finless porpoise, including whether they are competitors to each other.

Funds, as always, are a big problem. Conservation activities, such as population surveys, animal captures, operation of reserve, etc., demand a great deal of money.

Future of the Species

How great is the chance for saving these two animals? Since the baiji's population size is at such a low level, and it is very difficult to safely catch them, the chance of saving this species is not great. The finless porpoise is in much better shape, but if we do not act quickly enough, the state of the baiji today will be the state of the porpoise tomorrow. ■

Submitted by Zhang Xianfeng, Institute of Hydrobiology, Chinese Academy of Sciences.



Announcements

Field Grant Proposals Sought

The Center for Field Research invites proposals for 1998-1999 field grants funded by its affiliate Earthwatch, an international, non-profit organization. Past projects have included the following disciplines: animal behavior, biodiversity, ecology, ornithology, endangered species, entomology, ichthyology, herpetology, marine ecology, and resource and wildlife management. Interdisciplinary projects and multi-national collaboration are especially encouraged. For further information, visit <http://www.earthwatch.org/cfr/cfr.html>, or contact: The Center for Field Research, 680 Mt. Auburn St., Watertown, MA 02272, US; tel: +1 617 926 8200; fax: +1 617 926 8532; e-mail: cfr@earthwatch.org.

Course Offered in Wild Animal Health

Applications are invited from EC or overseas graduates in veterinary or relevant sciences for a 12-month MSc course in wild animal health beginning in October 1998. The course includes practical and theoretical instruction in the husbandry and nutrition of wild animals, taxonomy, conservation genetics, utilization of wildlife, welfare, epidemiology, immunology, infectious and non-infectious diseases, therapeutics, preventative medicine, and restraint, anesthesia and aspects of surgery in various taxa, together with an individual research project. Training will be given by staff at The Royal Veterinary College and the Institute of Zoology as well as invited speakers from other veterinary and zoological centers. Full particulars and an application form can be obtained from the Head of Registry or Dr. M.T. Fox, The Royal Veterinary College, Royal College Street, London NW1 0TU, UK; tel: +44 171 468 5000; fax: +44 171 388 2342.

International Bat Research Conference

The 11th International Bat Research Conference will be held in Brasilia, DF, Brazil on 2-6 August 1998 and will emphasize cutting edge and little known aspects of scientific knowledge regarding neotropical bat biology. Proposed themes for the general sessions are: behavior and communication, conservation, echolocation and feed ecology, ecology, education, evolution and systematics, morphology, growth and development, physiology, and reproduction. For further information, contact Jader Marinho-Filho or Ludmilla Aguiar, Departamento de Zoologia, Universidade de Brasilia, C. Postal 04474, Brasilia, DF 70919-970, Brazil; fax: +55 61 2741141; e-mail: ibrc11@guarany.unb.br

AMAZOO Congress

The II Congress of the Mesoamerican and Caribbean Zoo and Aquarium Association (AMAZOO) will be held at the La Habana Zoological Garden, La Habana, Cuba on 18-22 May 1998. For more information, contact Yolanda Matamoros, AMAZOO, Costa Rica (tel: 506 223 6701; fax: 223 1817; e-mail: fundazoo@sol.racsa.co.cr) or Elsie Perez, La Habana Zoo (tel: 537 81 8915; fax: 537 33 5582).

Incubation Software Available

A software program called Avian Incubation Management System (AIMS) is now available. Egg weights during incubation are entered and compared to taxon-specific databases to provide accurate weight loss control and management recommendations. The program is written in MS Foxpro 2.6a and is a stand-alone application requiring MS Windows 3.0 or higher. Technical support and on-site training is available. Program cost is UK £250. For more information, contact Avian Management Services, Hinton Cottage, Staunton On Wye, Hereford, Herefordshire, HR4 7LN, UK; tel/fax: 1981 500110; e-mail: avian@dial.pipex.com

Errata – CBSG News Vol. 8, No. 1, 1997

Giant Panda Master Plan: Giant pandas are found in Shaanxi Province, not Shanxi Province as reported, per Lu Houji.

The article *Status of Egypt's Birds* was erroneously credited to Dr. Atef Kamel. Information is this article should be credited to Mr. Sherif Baha El Din and Dr. Mahmoud Tharwat, *Birds, Egypt Country Study on Biological Diversity*, National Biodiversity Unit, Nature Conservation Section, Egyptian Environmental Affairs Agency, 1995.

We regret any inconvenience or confusion resulting from these errors.

1998 CBSG Annual Meeting

The City of Yokohama is proud to invite you to the 1998 CBSG Annual Meeting to be held 9 – 11 October 1998 in Yokohama, Japan. Invitations to the 1998 CBSG Annual Meeting will be mailed in January 1998.



Hotel and registration information will be provided at that time.



In Memory of Marialice Flucker Seal

By now, most of you are aware of the great loss recently suffered by CBSG and the international conservation community. Marialice Seal died on Saturday, 20 September 1997 at her home surrounded by her loving family. Marialice was a second mother to all of us in the CBSG office and a treasured friend to CBSG members all over the world. We are grateful for the overwhelming support shown by CBSG friends and members over the past few months, which has strengthened Ulie and his family during this difficult time. We also want to thank those of you who contributed to the conservation fund established in Marialice's memory. Over \$7,500 has been contributed, which will be used to assist in the further development of human dimension aspects of CBSG processes, in accordance with Marialice's wishes.



We were also saddened to learn of the death of Dr. John Kelly, who died on Saturday, 25 October 1997 at his home in Sydney, Australia. Dr. Kelly was the Director and Chief Executive Officer of the Zoological Parks Board of New South Wales and had served as the Chief Executive Officer of the Taronga and Western Plains Zoos since October 1987. He was admitted to the Order of Australia in January 1995 for service to conservation and the environment, particularly in the field of wildlife preservation and zoo administration. Dr. Kelly is survived by his wife, Suzanne, and their four children.



CBSG Schedule - 1998

This schedule changes constantly; contact the CBSG Office for an update before final scheduling. CBSG Staff Attending: (S)=Ulysses Seal, (E)=Susie Ellis, (B)=Onnie Byers, (M)=Phil Miller, (J) = Jenna Borovansky, (R)=Saleen Richter

1998	Travel	Meeting Dates	
Jan		5-8	Monticello, MN: Winged Maple Leaf Mussel PHVA (S,B,M,J,R)
	11,14	11-13	Montreal, Canada: McGill Uni (S)
	14,18	14-15	Toronto, Canada: Metro Toronto Zoo visit (S)
	14,18	16-17	Toronto, Canada: Biodiversity Network Mtg. (S)
Jan or Feb		10-13?	La Paz, Baja, CA, USA: Pinniped CAMP & Sea Lion PHVA (E,M) San Diego, CA, USA: Disease, Risk Mtg. (S)
Feb		6-8	Front Royal, VA: NOAHS Education Program Strategic Planning (E)
	9,13	10-12	Dallas, TX, USA: Year of the Tiger Mtg. (S)
	9,13	13	Dallas, TX, USA: <i>Save the Tiger Fund</i> Council Mtg. (S)
	13,20	14-20	Jersey, Channel Islands, UK: PHVA Facilitators Course (S)
	20,25	21-24	Parque Cabakeros, Spain: Iberian Lynx PHVA (S,E,B, Wildt)
March		6-8	Columbus, OH: Freshwater Mussel Symposium (S)
	6-27		Beijing and Chengdu: Giant Panda Biomedical Evaluation (E, Wildt)
	12,16	13-15	Antwerp, Belgium: CBSG Steering Committee Mtg. and ISIS Board Mtg. (S)
	?-24	19-23	Beijing: Giant Panda Biomedical Evaluation (S)
	24,28	25-27	San Jose, Costa Rica: Orchid CAMP (S)
April	12,25	13-24?	Botanical Gardens, Havana, Cuba: Endemic Plants CAMP (S)
	12,25	13-24?	Cuba: Solenodon PHVA (S)
	12,25	13-24?	Cuba: CAMP and Zoo Master Planning (S)
May		8-10	Graduation (E)
		Mid	Bratislava: Conference of the Parties of Biodiv.Conservation (S)
		18-23	La Habana, Cuba: AMAZOO Mtg. (E)
		22-30	Belo Horizonte, Brazil: Muriqui PHVA (S)
		30-2 June	White Oak, Florida, USA: CCF Science Planning (E)
June		?	El Salvador: Atele PHVA; CAMP (S)
	12,15	12-14	Montreal, CA: Human Demography Mtg. (S,E,B,M)
	19,23	20-21	Ojai, CA, USA: CCF Futures Search Progress Meeting (E)
	17-22	18-21	Manaus, Brazil: SSC Steering and Executive Mtg.
		25-29	South Carolina (S)
	?30-14 July?	Virginia (S)	
August		30-4 Sept.	Lae, Papua New Guinea: Tree Kangaroo CAMP/PHVA (S,M,B)
September		28-1 Oct	Chile: Humboldt Penguin PHVA (E, Lacy, Diebold, Duffy, S?)
October		8	Yokohama, Japan: CBSG Steering Committee Mtg.(S,E,B,M)
		9-11	Yokohama, Japan: CBSG Annual Mtg.(S,E,B,M)
		12-15?	Nagoya, Japan: IUDZG (S)
??	?	?	Sumatra, Indonesia: Sumatran Felid, Civet & Otter CAMP (B, Tilson)
??	?	?	Cali, Colombia: Endemics CAMP (S,E)
??	?	?	Columbia: Columbian Primates CAMP; Mt Tapir PHVA (E,S or M)
??	?	?	MN Zoo: GIS Software Training Course

CBSG *News*



*Newsletter of the Conservation Breeding Specialist Group
Species Survival Commission
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