



CBSG News

Inside...

- Transponders
- Monk Seal
- Florida Panther
- Arabian Oryx
- Noah Project
- Madagascar Fauna
- Regional Reports

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CBSG News Received in 147 Countries

The CBSG Newsletter is now being distributed to more than 3,400 people in 147 countries. This includes people in at least 1,200 zoos and aquariums. Included with the mailing of this Newsletter is a listing of all of the names, addresses, phones and fax numbers we have for people in your country. We would appreciate corrections of errors and suggestions for other people who are interested in the use of captive propagation for conservation and would like to receive the Newsletter. We are also interested in publishing material of conservation and captive propagation interest if you have materials that you wish to share.

The triennial meeting of the IUCN General Assembly in Perth, Australia during early November, 1990 marked the end of the three-year appointment cycle of the SSC and its Specialist Groups including the CBSG. Dr. Rabb has been reappointed as Chairman of the SSC and I have been appointed as Chairman of the CBSG. Our office will be sending reappointment letters to all of our previous members who have been active during the past three years. We will also be sending letters of appointment to the many new members who have asked to join CBSG during the past six months. It has been an exciting three years with the rapid growth of CBSG from less than 50 members to over 200. We now have active members from 37 countries. The growth and activities of the SSC and of the CBSG are expanding rapidly.

Transponders are an item of major interest to the captive breeding community. Transponders offer a technology for unobtrusive permanent individual animal identification applicable across nearly all vertebrates and some invertebrates. Registration of this number with ISIS provides the world's zoos with an important technique for following individual animals throughout their lifespan which is essential for scientific management of animal populations in captivity. These and other needs prompted the formation of an international working group, at the CBSG meeting 25-26 August 1989 in San Antonio, to assemble and evaluate information on available technologies.

This group reported back to the CBSG meeting in Copenhagen and indicated that there were several products available with apparently different capabilities, availability, and costs. A copy of the report and recommendations from the meeting was distributed in the report from the meeting and summaries were provided in the CBSG Newsletter (Vol. 1, Numbers 2 and 3). These products appeared to have different capabilities and to be incompatible requiring their own readers. The assembled participants (140 people from zoos and aquariums in 24 countries) agreed that it was desirable to choose one for recommended use by the entire international zoo and aquarium community. Recommendations were adopted and transmitted to the international zoo and aquarium community that: (1) that all zoos agree to use the same type of transponder, (2) that the final choice be delayed until the working group makes its final report, and (3) that the international working group compare and test the different devices and recommend a preferred choice by the end of January 1991. **The transponder report is included in this Newsletter (see page 3).**

We are now in the process of developing recommendations on the anatomical placement of the transponders in different groups of species and on priorities for choice of species. Eventually transponders will need to be placed in nearly all animals managed in zoos and aquariums and the ID number registered in ISIS as a central database if we are to successfully develop the number of international scientifically managed captive propagation programs for conservation that will be needed over the next 50 years.



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

Ulysses S. Seal, CBSG Chairman



**CBSG Conservation
Advisory Council**

Conservators:

American Association of Zoological Parks and Aquariums
Chicago Zoological Society
Cleveland Zoo
Columbus Zoological Gardens
Denver Zoological Foundation
Fossil Rim Wildlife Center
Friends of Zoo Atlanta
Greater Los Angeles Zoo Association
International Union of Directors of Zoological Gardens
Jacksonville Zoological Park
Lubee Foundation
Minnesota Zoological Garden
New York Zoological Society
Omaha's Henry Doorly Zoo
White Oak Plantation
Zoological Society of Cincinnati
Zoological Society of San Diego

Guardians:

Detroit Zoological Park
King's Island Wild Animal Habitat
North Carolina Zoological Park
Saint Louis Zoo
Toledo Zoological Society

Protectors:

Aalborg Zoo
Asmode, Jean Francois
Audubon Zoo
Banham Zoo
Caldwell Zoo
Calgary Zoological Society
Cologne Zoological Garden
Copenhagen Zoo
Dutch Federation of Zoological Gardens
Givskud Zoo
Japanese Association of Zoological Parks and Aquariums
Jersey Wildlife Preservation Trust
The Living Desert
Marwell Zoological Park
National Federation of Great Britain and Ireland Zoos
National Zoological Park, Smithsonian Institution
North of England Zoo
Odense Zoo
Pencynor Wildlife Park
Riverbanks Zoological Park
Royal Zoological Society of South Australia
Royal Zoological Society of Antwerp
Royal Zoological Society of Scotland
San Francisco Zoological Gardens
Thrigby Hall Wildlife Gardens
Twycross Zoo
Union of German Zoo Directors
Urban Council Hong Kong
Washington Park Zoo
Wildlife Preservation Trust International
Wilhemas Zoo
World Parrot Trust
Yong-in-Famland
Zoological Society of London

Contents...

| | |
|--|----|
| Final Report on Transponder Testing | 3 |
| News Bites | 4 |
| Mediterranean Monk Seal Meeting | 5 |
| Contraceptive Implants Available | 6 |
| Florida Panther Propagation Plans Approved | 7 |
| Lawsuit Threatens Florida Panther Recovery | 7 |
| Synopsis of Florida Panther Recovery Efforts | 8 |
| Recent Arabian Oryx Developments | 8 |
| Disease Outbreak in Arabian Oryx | 10 |
| Siberian Ferret Study | 10 |
| Plant Genetic Resources Recommendations | 11 |
| Noah Project News | 11 |
| Przewalski Horse Progress Report | 12 |
| Madagascar Fauna Report | 14 |
| Kangaroo Status Review | 16 |
| Spix Macaw Conservation | 17 |
| International Panda Conference | 18 |
| IUCN Resolution on the Giant Panda | 19 |
| IUCN/SSC List of Action Plans | 19 |
| News from India Zoos | 21 |
| Australasian News | 22 |
| Southeast Asia Zoo Association Formed | 23 |
| AAZPA Conservation News | 23 |
| Meetings | 25 |
| Dictionary of Acronyms | 26 |

CBSG News

The CBSG news is published by the Captive 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 and comments are welcome. Send materials to: CBSG News, 12101 Johnny Cake Ridge Rd., Apple Valley, Minnesota 55124 USA. Ph: (612) 431-9325; Fax: (612) 432-2757.

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I.U.C.N./C.B.S.G. Working Group on Permanent Animal Identification

Final Report on Transponder System Testing and Product Choice as a Global Standard for Zoological Specimens

Transponders offer a technology for unobtrusive permanent individual animal identification applicable to most vertebrates and some invertebrates. Registration of the unique identification number with the International Species Information System (ISIS) would provide the world's zoos with an important technique for following individual animals throughout their life.

Because there were several products available, a Working Group was formed at the 1989 CBSG meeting to assemble and evaluate information on transponders. At the 1990 CBSG meeting in Copenhagen, substantial information was presented on the applications and standardization of transponders for permanent identification of non-domestic animals. Previous reports have addressed issues such as central registration, medical concerns, and limited read-ranges (see CBSG News, Vol. 1, Nos. 2, 3). However, due to the lack of consistent information available to the Working Group, a recommendation as to which system should be recommended as a global standard could not be made.

At the Copenhagen meeting, it was recommended that the CBSG urge all concerned parties to postpone their selection of a specific transponder system until the competing systems could be independently evaluated. This side-by-side evaluation, conducted by members of the Working Group, has been completed and a recommendation can now be made that is independent of the manufacturer's performance claims. The criteria for evalu-

Table 1. Results of Transponder System Tests

| <u>Manufacturer</u> | <u>Manufacturer's Suggested Read-Range</u> | <u>Actual Read-Range (Mean \pm SE)</u> |
|---------------------|--|---|
| Destron/I.D.I. | 5.0 cm | 2.6 \pm 0.1 cm |
| A.V.I.D. | 5.8 cm | 5.2 \pm 0.1 cm |
| Destron/I.D.I. | | |
| small | 11.4 cm | 5.6 \pm 0.6 cm* |
| medium | 29.2 cm | 12.9 \pm 0.2 cm |
| large | 38.1 cm | 16.4 \pm 0.4 cm* |
| Trovan/A.E.G. | 15.0 cm | 10.7 \pm 0.4 cm |

*Actual Read-Range calculated from only five readings due to battery problems in the reader. Statistical analysis by ANOVA for repeated measures of the read distances for the four similar-sized products ($F = 91.3$, $P = 0.001$). The Trovan had a greater read distance than the small Destron/I.D.I. and A.V.I.D. products ($P = 0.01$).

ating the systems were: (1) product performance, (2) commercial availability by January 1, 1991, (3) international distribution, and (4) price.

Product performance was evaluated by reading implants against a measured grid background. All systems were

Table 2. Transponder system costs (all values in \$U.S.)

| <u>Manufacturer</u> | <u>Reader</u> | <u>Transponder</u> | | <u>Commercial Availability</u> | <u>International Distribution</u> |
|---------------------|---------------|--------------------|----------------|--------------------------------|-----------------------------------|
| | | <u>Plain</u> | <u>Sterile</u> | | |
| A.V.I.D. | 1,250.00 | 8.50 | N/A | Yes | No |
| Destron | 815.00* | | | No* | Yes |
| Small | | 5.50 | 11.25 | Yes | Yes |
| Medium | | 7.75 | N/A | Yes | Yes |
| Large | | 8.25 | N/A | Yes | Yes |
| Trovan/A.E.G. | 837.00 | N/A | 5.85 | Yes | Yes |

*New Dual Coil Reader was used for this test. Other, shorter reading readers are available. N/A = Not Available.

Transponders...

calculated. In each instance, the transponders were placed flat on a table top in an orientation parallel to the reader. Although this orientation produced the shortest read-range for all systems, it most closely approximates the actual orientation of the transponder in most implanted specimens. System testing was recorded on videotape and copies are available upon request from Dr. Blumer. The original transponder system manufactured by Destron/I.D.I. was also included in the testing to illustrate the improvements made in the development of the current systems.

In addition to the findings listed in Tables 1 and 2, several other considerations were made by the Working Group:

1. Medium (3 x 18 mm) and large (3.5 x 29 mm) transponders would not be acceptable in the majority of specimens. Therefore, product choice should be based on the performance/price of small transponders (app. 2 x 11 mm).

2. Most experience with transponders has been based on bulk-packed implants which were sterilized by the user and required re-use of the implanter needle. The availability of pre-packaged, sterile transponders packaged in needles will result in easier and less traumatic use of these systems.

Based upon the criteria listed above, the Working Group has chosen the Trovan/A.E.G. transponder system as the preferred system for the development of a global standard. These findings will be forwarded to numerous international authorities (CITES, EEC, USFWS, etc.) along with the recommendation that they adopt similar standards. The Trovan/A.E.G. system can be purchased from:

North America:

International Infopet Systems
31264 La Baya Drive, Suite A
Westlake Village, CA 91362, USA
Telephone: (818) 707-9942; (800) 463-6738
Telefax: (818) 707-9947
Contact: Lindy Harton

Europe:

Euro I.D.
Grossbuellesheimer Str. 56
5350 Euskirchen 16
West Germany
Telephone: (02251) 7 11 25
Telefax: (02251) 7 34 88
Contact: Mr. Usling

For additional information, contact:

| | |
|-----------------------------|--------------------------|
| Dr. Evan S. Blumer | Paul van den Sande |
| Fossil Rim Wildlife Center | Royal Zoological Society |
| P. O. Drawer 329 | of Antwerp |
| Glen Rose, TX 76043, U.S.A. | Koningin Astridplein 26 |
| Telephone: (817) 897-3147 | B-2018 Antwerpen, |
| Telefax: (817) 897-3785 | Belgium |
| | Telephone: 03-231-16-40 |
| | Telefax: 03-231-00-18 |

News Bites...

Conservation Biology Program Established

The Connecticut Chapter of The Nature Conservancy has established a Conservation Biology Research Program. The program is open to Masters and Ph.D. candidates interested in conducting basic research on endangered species, communities, habitat, and ecosystems. The program also is intended to advance the conservation of biological diversity within the state of Connecticut. For more information, contact Beth Lapin, Director of Science and Stewardship, The Nature Conservancy, 55 High Street, Middletown, CT 06457, USA.

Bat Captive Action Plan Survey

Nina Fascione, Philadelphia Zoo (U.S.), was asked by the CBSG Chiroptera Planning Group to conduct a survey of North American bat collections. The goal of the survey is to determine the amount of space available for bats and which species are currently being maintained. These data will be used for strategic planning purposes in order to make the most effective and productive use of available space. She will collaborate with Dr. Chris West, Bristol Zoo (U.K.) who is conducting a similar survey of European zoos. In addition, there is an AAZPA Chiroptera Taxon Group being formed which will be chaired by Reg Hoyt, Phoenix Zoo (U.S.). The purpose of this group will be to organize captive propagation and husbandry efforts for Chiropterans in the North American region. Holders of Chiroptera are encouraged to participate in this survey. Please contact: Nina Fascione, Research Associate, Philadelphia Zoological Garden, 34th St. & Girard Ave., Philadelphia, PA 19104. Ph: 215) 243-1100.

Giant Clam Poaching in Indonesia

The IUCN Mollusc Specialist Group intervened earlier this year as part of an effort to improve protection for one of the last remaining healthy populations of the Giant Clam, *Tridacna gigas*, in Indonesia. The population lies in the proposed Teluk Cenderawasih Marine Conservation Area in Indonesia, on a reef which has been nicknamed 'Tridacna Reef'. In the latter part of 1989, it was discovered that clams were being taken illegally on a regular basis by a Japanese fishing vessel in partnership with a local company. The adductor muscle was being exported to Asia, and the less valuable mantle being sold to a local crocodile farm as food. From the numbers of dead shells left and reports of the amount of adductor muscle being collected, it was estimated that well over 1,000 old, large individuals had been taken.

When the alarm was raised, a number of international conservation bodies sent letters of intervention to the Governor of Irian Jaya and to the Director General of Forest Protection and Nature Conservation. Alison Kay wrote on behalf of the IUCN Mollusc Group. The situation seems to have eased, although until the area has full protection and enforcement as a Marine Conservation Area, the clams will still be vulnerable.

Meeting Urges Action to Safeguard Mediterranean Monk Seal

An emergency meeting to develop a conservation strategy for the Mediterranean monk seal (*Monachus monachus*), called by the Commission of the European Communities on 17 November 1990 recommended that such a strategy should be drawn up in consultation with the IUCN Seal Specialist Group, the Captive Breeding Specialist Group, and the Hawaiian Monk Seal Recovery Team. Experts from these groups met in Texel, Netherlands, on 10-11 December 1990. They reviewed the current status of the monk seal, evaluated the threats to the remaining populations of this species, estimated the risks of extinction for these populations, and considered what urgent action would be most likely to reduce these risks.

The range of the Mediterranean monk seal can be conveniently divided into three areas; the North Atlantic, the western Mediterranean (west of 16°E), and the eastern Mediterranean and Black Sea (east of 16°E). These divisions have been made on the basis of geographical convenience. However, there is some evidence that there may be genetic differences between North Atlantic and western Mediterranean monk seals.

Most of the published figures for monk seal population size are based on the opinions of local fisherman and naturalists. It is therefore difficult to evaluate their accuracy. Only for the North Atlantic population and two local populations in Greece are numbers based on direct counts, or estimates derived from the number of individually recognized animals in the area.

Within the North Atlantic, monk seals still survive at only two locations; The Desertas Islands, southeast of Madeira, and in a group of caves around the border between Mauritania and Morocco. The Madeiran population has declined significantly over the last decade and now contains around 8-10 individuals. Counts of seals in Mauritania/Morocco have been around 70-80 individuals for the last 50 years, and this population has shown no evidence of decline or increase.

During the last 20 years the monk seal has disappeared from mainland Spain, the Balearic Islands, Corsica, Sicily, Malta and probably Tunisia. The population in Algeria is reported to have declined substantially in recent years.

In the eastern Mediterranean and Black Sea the monk seal may still occur in Yugoslavia, Albania, Bulgaria and Libya, although there are no reliable estimates of numbers from these countries. The most recent survey in Turkey reported that monk seals had disappeared from a number of sites and concluded that the population was at the low end of the range 50-100.

In Greece, there are reliable estimates of numbers from only two localities (the Northern Sporades and the Ionian Sea). At both locations there appears to be a resident population of up to 30 animals. Seals are known to occur elsewhere in Greece but

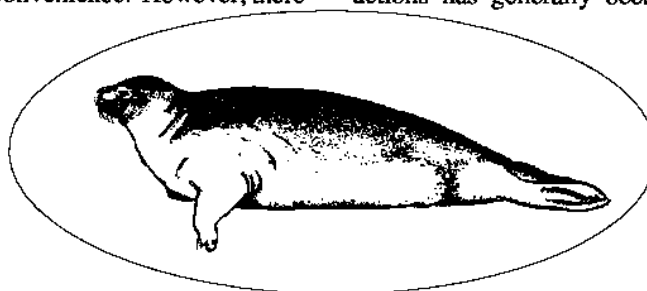
there are no estimates of numbers. The potential threats to the Mediterranean monk seal have been clearly identified since the First International Conference on the Mediterranean Monk Seal in 1978. Briefly they are: 1) increased adult and juvenile mortality because of deliberate killing (mostly by fishermen); 2) increased adult and juvenile mortality caused by incidental entanglement in fishing gear; 3) increased pup mortality caused by pupping in unsuitable locations, due to loss of suitable habitat; 4) poor condition due to lack of food as a result of over-fishing; and 5) reduced fecundity and pup survival caused by inbreeding depression. The following threats can now also be added: 6) large scale mortality caused by virus infection and 7) mortality caused by oil spills.

Management actions which would help to reduce the impact of the threats have been suggested by a number of international meetings since 1978. However, progress on these actions has generally been slow. The meeting reviewed this progress and identified the risks associated with them. It then considered what new and urgent action might be taken to prevent the extinction of the species.

The establishment of protected areas which include known monk seal pupping sites is undoubtedly the most effective way to preserve the species. Protection of areas where the species occurred formerly provides an opportunity for future reintroductions and translocations. However, the establishment of such areas requires specific legislation and wide consultation with all interested parties. As a result only two of the 22 protected areas proposed by the 1978 International Conference on the Mediterranean Monk Seal have been established - in the Northern Sporades, Greece, and the Desertas Islands, Madeira. The Cabo da Gato area in Spain, which used to hold monk seals, has been declared a Parque Natural, and there are plans for protected areas in the Chafarinas Islands (Spain), Gulf of Orosei (Sardinia), and the Ionian Sea.

It should be recognized that such protection areas require a long term commitment of funds and resources. Without this there is a risk that the publicity associated with the establishment of a protected area may actually increase disturbance to the seals in the area.

Although the monk seal is legally protected throughout much of its range (but not in Morocco), deliberate killing is known to continue. This must be reduced or halted if the species is to survive in the eastern Mediterranean. Improved public awareness in probably the most effective way to achieve this, although progress is likely to be slow. It is unlikely that the opinions of older fishermen will be changed, but the increased chance that the illegal killing will be observed and reported should act as a deterrent.



Monk seal...

Experience with the Hawaiian monk seal had shown that injured seals brought into rehabilitation centers have high survival (>60%) at these centers, and very high survival when subsequently released. Releases of rehabilitated animals have a small, but important, effect on local population size. Rehabilitation centers were also important for increasing local public awareness, for improving local skills in handling and maintaining seals, and as a source of blood samples to provide information on population genetics and disease incidence. The establishment of good observer networks would increase the probability that seals in need of rehabilitation are found.

The potential impact of an epidemic caused by a distemper virus on a local seal population is sufficiently great that the potential effectiveness of a vaccination programme should be investigated as a matter of urgency. If a single vaccination with an inactivated vaccine can be shown to provide protection, consideration should be given to prophylactic vaccination of the North Atlantic population, which is more accessible and more at risk than the eastern Mediterranean one. Vaccination in Greece should only be considered if there is direct evidence of distemper infection amongst seals there. However, seals in Greece are known to come into contact with beech martins and goats. There is therefore a small, but finite, risk that they could contract canine distemper (CDV) or peste des petites ruminants (PPR). The prevalence of these viruses in wild carnivore and domestic goat populations in the Ionian and the Northern Sporades should be investigated.

The progress and effectiveness of the management actions described above is unlikely to have a sufficient effect on the survival of the remaining monk seal populations in the immediate future. It is therefore necessary to consider other, more urgent, actions. The most obvious of these is the establishment of a breeding population in captivity. Such a population would serve to preserve the species, and ultimately to provide animals for reintroduction or reinforcement of existing populations (provided that these can be given adequate protection).

The risks of extinction for the remaining monk seal populations in the eastern Mediterranean are unclear. In these circumstances the meeting recommended that all rehabilitated animals should be retained in captivity to form the nucleus of a captive breeding population. The aim should be to have 20 such animals by 1995. If it proves impossible to obtain this number of rehabilitated animals and if the recommended surveys indicate that there are no, or only a small number of other sizeable monk seal populations in the region then weaned pups should be captured and brought into the breeding programme. Such removals, if carried out over 2-3 years, would have a minimal effect on the risk of extinction for these local populations.

Any captive breeding programme for monk seals should conform to the standards established by the Europäische Erhaltungszucht Programme based at Cologne Zoo in association with the European Community Association of Zoos and

Aquariums. The short term goal of monk seal conservation should be to prevent the disappearance of any monk seal populations in the eastern Mediterranean and North Atlantic. In the longer term the goal should be to re-establish viable monk seal populations in as much of the species' former range as is practicable.

There are some actions which are so urgent that they should be initiated before the detailed discussions at the proposed regional and national meetings are complete. These are: 1) surveys to locate and enumerate additional monk seal populations in the eastern Mediterranean; 2) clearance of mines along the coast in the region of the Mauritania/Morocco border to allow monitoring of the seal caves and rescue of injured or abandoned seals; 3) establishment of a monitoring programme in Mauritania and Morocco, and development of plans for a protected area; 4) molecular studies of the genetic relationship between monk seals in North Atlantic, western Mediterranean and eastern Mediterranean; 5) trials of an inactivated distemper vaccine in Hawaii and Mauritania, and evaluation of the risks of cross-infection from wild carnivores and domestic goats in Greece. No vaccination of wild monk seals should be conducted before this experiment has been completed; and 6) evaluation of the feasibility of capturing young monk seals in the Western Mediterranean for a captive breeding programme.

In addition, there is an urgent but less pressing, need for information on the current status of monk seals in Yugoslavia, Albania, Libya and the Black Sea.

Contraceptive Implants Still Available

For over a decade, steroid contraceptive implants have been provided to zoos and other agencies by Dr. Ulysses Seal, CBSG chairman. With his retirement from the Veteran's Administration, he will no longer have the facilities to continue manufacture of these implants. The implants, however, will still be available through Dr. Edward D. Plotka, Marshfield Medical Foundation. The implants have been used in dozens of species and are generally effective for up to three years. Individuals needing contraceptive implants for female animals must send their request in *writing* to: Dr. Edward D. Plotka, Marshfield Research Foundation, 1000 North Oak Ave-2R3, Marshfield, WI 54449-5790, USA. The minimum information required in such requests should be the (1) genus and species of the animals to be implanted, (2) the identification number of *each* animal, and (3) the body weight of *each* animal. Requests must be received 30 days prior to the desired date of implantation. Individuals having questions can call Dr. Plotka at 715 387-9177. There is no charge for these implants which cost \$75-\$100 (U.S.) to manufacture. Donations of \$25 per implant, however, may be sent the AAZPA Conservation Endowment Fund for CBSG support.

U. S. Fish and Wildlife Service to Move Forward on Propagation of Florida Panthers...

The U.S. Fish and Wildlife Service has decided to move forward on a plan to breed endangered Florida panthers for reintroduction back into the wild. U.S. Fish and Wildlife Service Director John Turner made the announcement after a "finding of no significant impact" on the propagation proposal was signed by Southeast Regional Director James W. Pulliam, Jr. This decision was based on an environmental assessment (EA) that analyzed the impact to the environment of removing select panthers from the wild for use in the program.

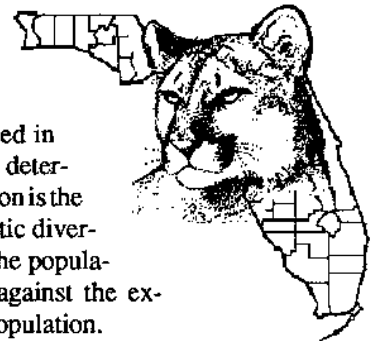
The finding opens the door for the Service to issue a permit to the State of Florida to begin capturing representative members of the *Felis concolor coryi* subspecies. No action will be taken on the permit issuance until 30 days following the publication of the finding in the *Federal Register* which occurred in December, 1990.

The Florida panther is one of the nation's most critically endangered animals. One population of approximately 30 - 50 adult animals, located in South Florida, is all that remains. Population viability and species survival analyses conducted under the auspices of the Florida Panther Interagency Committee concluded that the species would become extinct within 25-40 years under prevailing demographic and genetic conditions. The Interagency Committee, which is composed of two Federal and

two Florida agencies involved in panther recovery efforts, has determined that a captive population is the best means to preserve genetic diversity, significantly increase the population, and provide security against the extinction of the single wild population.

The Interagency Committee's breeding plan involves the incremental removal of select Florida panthers (primarily kittens) from the wild over a 3-6 year period to establish a managed population representative of the known available genetic material. The managed population would be developed in such a way as to have minimal impact on the wild population and its self-sustaining capabilities. This would be accomplished by removing up to six kittens and four older animals from the wild the first year and up to six kittens and two older animals the following years.

"The breeding plan represents an important component of our overall efforts to save this magnificent creature from extinction," said Director Turner. "It in no way implies a lessening of our commitment to the most critical factor in the recovery effort, the preservation of Florida panther habitat."



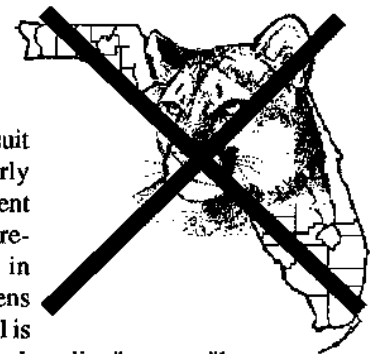
...as Lawsuit Threatened to Halt Progress on Captive Breeding Efforts

A lawsuit to force the U. S. Fish & Wildlife (USFWS) Service to prepare an environmental impact statement (EIS) before USFWS proceeded with the Florida panther captive breeding and reintroduction program was threatened by the Fund for Animals, Inc., a national "animal rights" organization, and Holly Jensen, a Florida environmental activist.

In a letter from their attorneys, several issues of concern were raised: removal of 30 panthers from the wild over a six-year period; availability of suitable habitat for release of captive-bred panther; the concern that Florida panthers will not breed in captivity; the impacts that removal of panthers from the wild will have on the remaining free-ranging population; the impact that removal of wild-born kittens will have on the survival of the wild population; insufficient opportunity for the public to comment on an alternative plan to introduce other panther subspecies as a means of increasing genetic diversity; and that the USFWS intends to review and rule on specific permit applications without giving the public an opportunity to comment on them.

The threatened lawsuit was settled out of court in early February 1991. This settlement substantially reduces and restricts the proposed plan in several ways: only six kittens will be removed; the removal is

for "possible future captive breeding" not a "long-term captive breeding program"; only one, not four, captive facilities in Florida will receive permits without further public notice and review; the Fund for Animals and Ms. Holly Jensen will have opportunity to informally review applications for subpermits to place animals at other captive facilities; allowable permits are valid for only one year during which the USFWS will issue a supplement to its Final Environmental Assessment which will be used to determine if long-term captive breeding is to occur; and if long-term captive breeding is not to occur, the kittens removed will be returned to the wild "as soon as practical".



A Brief Synopsis of the Florida Panther Recovery Efforts

Because efforts to prevent the extinction of the Florida panther have become controversial (see previous story), CBSG News thought our readers would like to review a brief history of these efforts.

- Florida panther listed as a Federal endangered species in 1967. Recovery team appointed in 1976. Recovery plan approved 1981.

- Florida Panther Interagency Committee (Committee) formed in 1986. Members: National Park Service, Florida Game and Fresh Water Fish Commission, Florida Department of Natural Resources, and the U.S. Fish and Wildlife Service.

- Revised recovery plan approved in 1987. Focused on understanding the species' biology, identifying and reducing or eliminating threats to the species, and improving and preserving habitat. Recovery actions directed at reducing road mortalities, increasing the prey base, creating travel corridors, and acquiring habitat.

- Population Viability Analysis/Species Survival Planning workshops held January 1989 and October-November 1989. Consensus that Florida panther vulnerable to rapid extinction within the next 25-40 years and that captive breeding program should be undertaken as soon as possible.

- The notice of availability of draft Environmental Assessment (EA) for proposed Florida panther breeding program was published in *Federal Register* on June 15, 1990. Notice announced three public meetings, which were held in Florida on July 10, 1990, in Tampa; July 11, 1990, in Lake Worth; and July 12, 1990 in Gainesville.

- Approximately 500 letters of comment received on proposed program, 81 percent from within Florida. Approximately 30 were organizations, with remainder from individuals. An estimated 50 percent were explicit in their support of program, while about 22 percent explicitly opposed. Remaining 29 percent more general in their comments or had no position.

- Notice of availability of final Environmental Assessment and "finding of no significant impact" will appear in *Federal Register* on December 19, 1990. Permit to the State of Florida to begin capturing Florida panthers for breeding program will not be issued prior to January 18, 1990.

- Managed breeding population is considered critical to species survival, but would be carefully evaluated. Each year a determination would be made as to whether or not to continue removing animals from the wild for breeding.

- Zoological institutions that have submitted applications to participate in managed breeding program: Jacksonville Zoo, Lowry Park Zoo (Tampa), Miami Metro Zoo, White Oak Plantation (Yulee).

- Habitat preservation single most important factor in panther recovery and receiving significant attention.



- Recent legislation authorizing expansions for Big Cypress National Preserve and Everglades National Park will add approximately 146,000 acres and 108,000 acres, respectively.

- Florida Panther National Wildlife Refuge will consist of approximately 30,000 acres when acquisition is complete.

- Proposed land acquisition within southern Golden Gate Estates development in southwest Florida will add approximately 40,000 acres to Fakahatchee Strand State Preserve.

- Of 2.2 million acres of land currently used by Florida panthers, 1.2 million acres are publicly owned, while 1 million acres in private ownership. Florida Panther Interagency Committee to seek cooperation from private landowners.

- Results of recent study on genetic makeup of Florida panthers suggest that present free-ranging Florida panthers contain genetic material traceable to two genetically distinct stocks, one of North American origin and one probably from Central or South America. Every Florida panther living today, however, is descended from the population originally listed in 1967. Biologists and geneticists studying the Florida panther believe that this unplanned infusion of genetic material may have benefited the Florida panther by increasing genetic variation while at the same time not "swamping out" evolved Florida panther genetic makeup.

Recent developments in the re-introduction of the Arabian oryx (*Oryx leucoryx*) to Oman

The Arabian Oryx was first re-introduced to the wild in the central desert of Oman in 1982. Since 1988, the population has increased from 37 to 109 animals which roam unrestricted over an area exceeding 10,000 km². This report will summarise recent developments with emphasis on population dynamics, reproduction, and genetic status but will also describe a new monitoring programme.

Releases of oryx occurred in 1982, 1984, 1988, and 1989. Today immigrants comprise 20% of the population. The mean yearly increase in the total wild population and in Oman-born animals since 1982 was 36% and 57% with doubling times of 2.5 and 1.8 years, respectively. These figures compare with a doubling time for the total captive world herd to 1978 of 4.0 years.

The Oman-born population increased by a factor of 2.5

between December 1987 and December 1989. The start of this period of growth can be traced back to the summer of 1986 when rains broke a long drought. Good rainfall has occurred in all subsequent years. Another factor in the poor productivity of the population before 1987 was the presence of a sterile but dominant bull which was later castrated.

The rapid growth in recent years has produced a very young population. The population has a mean age of 3.5 years with the oldest animal, an immigrant, being 13.3 years. Over 65% of the population is less than three years of age and 50% less than two years.

Given reasonable grazing, the dynamics of the population discussed above indicate a continued exponential increase through the early 1990's. Data for this year suggest that growth may slow as natural mortality factors increasingly come into operation. Though 27 calves have been born, there have been 12 deaths in 1990. This represents 40% of all deaths amongst the wild population since the first release in 1982. Most of the deaths have resulted from fighting or infanticide. This is the first time that fighting deaths have been recorded and there had only been one case of infanticide in previous years. Only continued monitoring for the next few years will confirm whether natural selection will increasingly come into play.

In the last few years, there have been important developments in the reproductive success of the population. Mean age at first calf for desert-born females has fallen from 35 months for the animals born in the period 1980-1987 to 23 months for those born in 1988. Females are now coming into first oestrus at 13 months and calving at 21.5 months. Calf survival in 1988 and 1989 was 95% and 96%, respectively, but fell to 81% in 1990. This compares with 71% for the years 1980-1987.

Lifetime reproductive success of the oryx is not yet known as no animals have died from old age. The first female to calve in Oman is 12.4 years old and has continued to breed producing 12 calves to date. However, there is a strong suggestion that the oldest male at 13.3 years is no longer able to sire calves, though he is able to find potential breeding positions. Failure of a number of females to conceive has been linked to old age in immigrant males. Fortunately, such non-productive associations are rarely long term because of the dynamic nature of the population with frequent changes in herd bulls.

The length of inter-calf interval can be a good indicator of female reproductive success. In 1990, 64% of births to breeding females were the result of postpartum oestrus matings. However, the use of inter-calf interval as a measure of female success is confused by the possible development of a calving season where females may delay conception to avoid parturition in the hotter months. Of animals conceived in Oman since 1980, just 20% were born in the four-month period May to August when the hottest conditions occur.

Male breeding success has also changed considerably in recent years. Up to the end of 1986, all calves had been sired by three bulls. Today, calves have been sired by 19 immigrant

and wild-born bulls. Ages of 1.7 years for first successful mating have been recorded for wild born bulls. Fighting deaths amongst breeding bulls in 1990 increased the potential breeding opportunities for the young males.

In recent years, a number of animals have been recruited from founder lines that were not represented in the U.S. captive herds. These included animals from Jordan of Qatari descent and offspring of a bull of the Bahrain line. These additions have added greatly to the size of the gene pool to the point that the founder genome, a measure of genetic diversity, of the wild population is comparable with that of the U.S. population which numbered 340 animals at the end of 1989. From a genetic standpoint, there is little more to be obtained from the U.S. herds. However, there remain animals in Arabian collections whose lines are under-represented in the Oman wild herd.

Small populations are prone to inbreeding problems, particularly when the burden of reproduction rests on a small number of females and an even smaller number of males. This was the case in Oman for the first few years. Inbreeding depression results from the expression of deleterious genes as a result of the mating of closely-related individuals. Inbreeding levels were assessed in late 1988. It was concluded that inbreeding was at quite low levels, though calves that died at less than 12 months were more inbred than those that survived. However, a current analysis with a sample of 70 animals conceived in Oman and born before 17 November 1989 showed that there was no significant difference (Mann-Whitney U, $U=374.5$ $p=0.679$) in inbreeding levels between calves that died at less than 12 months and those that survived. The recent changes in social structure of the population with increased dispersal of males and females and the increase in numbers of breeding bulls should help reduce inbreeding levels.

A chromosomal translocation (Robertsonian translocation) in captive oryx in Saudi Arabia was described in 1989. Of eight animals imported from Jordan, two carried this translocation and one was a homozygote. Studbook information indicated that the dam of the homozygote originated in Qatar. Oman has received five oryx from Jordan and karyotyping of 2 of these animals identified them both as carriers of this Robertsonian translocation.

Robertsonian translocations involve the fusing of two chromosomes to give in a heterozygote a karyotype of $2n = 57$ compared with the usual $2n = 58$. Homozygotes will have a chromosomal complement of $2n = 56$. Robertsonian translocations have been reported in a range of mammal species and reduced fertility has been reported in some species including beef cattle and blue foxes.

In May of this year, a meeting of the International Wild Arabian Oryx Advisory Panel (IWAOP) of the IUCN/SSC Re-Introduction Specialist Group was held to discuss these different chromosome arrangements. The panel examined breeding data from both Oman and Saudi Arabia and there was no conclusive evidence of fertility effects amongst carriers. The panel also

Oryx...

found no indication that this chromosome re-arrangement resulted from hybridization between different oryx species. It was agreed that translocation carriers should not be removed from captive and wild populations but that they should be closely monitored for breeding success.

In Oman, a programme of karyotyping to determine the extent of the occurrence of the translocation has just been completed. Close monitoring of the two known carriers has continued and early results do suggest reduced breeding success of one of these males. However, more data is required before the significance of this discovery is fully understood.

As the population approached 100 early in 1990, it was apparent that it was time to review and revise a monitoring programme developed for a small population where the close monitoring of individual performance was necessary. As a population expands, the primary threats to survival are demographic and require a different level of monitoring. Further it was no longer possible to maintain the high degree of accuracy of earlier years.

A new programme was developed which allows a proportion of the population to be accurately monitored for at least the next five years. A total of 39 focal animals were selected and a small number of young animals will be recruited at the beginning of each year. Animals not readily recognised by the Harasis ranger force were immobilised and ear tagged. Six areas of monitoring were identified; productivity, population dynamics, social structure, range development, post-release monitoring, and genetic considerations. A different sample size and sampling frequency is required for each monitoring objective. This new programme commenced on 1 April 1990.

This report was submitted by Andrew Spalton, Project Biologist

Disease Outbreak in Arabian Oryx in Jordan

In early December, 1989, a herd of 85 Arabian oryx (*Oryx leucoryx*), owned and managed by the Jordanian Royal Society for the Conservation of Nature (RSCN) in the Shaumari Reserve were observed to be losing condition and some were coughing. Most of the affected animals were lactating females and calves. A preliminary investigation revealed lungworm (*Dictyocaulus filaria*) and gastrointestinal parasitic infection coupled with malnutrition and water deprivation due to a drought. The herd was lured into a small enclosure of about two hectares where water and supplementary food were supplied. The herd was then injected with ivermectin, an anti-parasitic drug. In January, 1990, 13 oryx died and postmortem examinations yielded a presumptive diagnosis of *Pasteurella pneumonia* which was later confirmed by the government veterinary laboratory.

Following this diagnosis, the whole herd was vaccinated twice 30 days apart with an inactivated vaccine against *P. haemolytica*, biotypes A1, A2, T10 and *P. multocida* types A and D.

Following vaccination and improved nutrition, the herd was released back into the 22 sq km enclosure with no further deaths.

It is considered that the social stress created by confining 85 animals of five separate social units in a small area coupled with malnutrition and inclement weather conditions probably precipitated the outbreak of pasteurellosis. Future management plans for the herd include reducing numbers by the translocating and establishing a satellite herd and providing piped water in the late summer when the halophytic vegetation in the Shaumari Reserve becomes unpalatable.

Siberian ferrets used as surrogate black-footed ferrets in release study

Black-footed ferrets (*Mustela nigripes*) are an endangered carnivore that once spread across the Great Plains of North America. They are habitat specialists depending on the prairie dog community for survival. Ninety percent of their diet is prairie dog and they inhabit prairie dog burrows. The last known population of black-footed ferrets, located near Meeteetse Wyoming, was decimated by canine distemper in 1985. Captive breeding, headed by the Wyoming Game and Fish Department in cooperation with the U.S. Fish and Wildlife Service and the SSC Captive Breeding Specialist Group of the IUCN, was the main hope for survival of the species, and it has been successful. The next step in recovery of the species is the reintroduction of captive-raised, black-footed ferrets in the fall of 1991.

During 1989 and 1990, the U.S. Fish and Wildlife Service and the Conservation and Research Center of the National Zoological Park researched ways to facilitate the reintroduction of captive-raised black-footed ferrets using a congeneric surrogate, the Siberian ferret (*Mustela eversmanni*). We tested development of predator avoidance abilities and hunting effectiveness, and we investigated methods of preparing ferrets for release as well as different release techniques.

Our results indicated that naive juvenile Siberian ferrets would react to a predator (both a stuffed avian and terrestrial model or a live dog) after three months of age, and those responses could be significantly improved after a single aversive experience. When hunting in a 200 m² mock prairie dog town, three-month-old naive juvenile Siberian ferrets could both locate food in a burrow and could dispatch prairie dogs, but these abilities also improved with experience. Siberian ferrets with previous exposure to burrow systems spent significantly more time underground when introduced to an unfamiliar environment than did cage-raised controls deprived of access to burrows.

During these experiments, we looked at individual behaviors, but the way a behavioral trait is expressed depends on

the simultaneous use of other behaviors necessary for survival and reproduction. So, during the 1990 experimental release of captive-raised Siberian ferrets, we tried to provide a prerelease environment closer to the one ferrets would encounter in nature by raising some of the animals in two mock prairie dog colonies from three months of age until release (design problems prevented raising ferrets in the arena from birth). The other release technique involved no pre-release conditioning, but a post-release refugia in the form of a cage on stilts at the reintroduction site (similar to raptor hacking). The nest box attached to the release cage was the box in which the Siberian ferrets had been raised. Both groups were supplementary-fed for a short period of time. Ferrets were released at two sites (both groups represented at both sites) with one site having predator densities three time higher than the other.



Siberian ferrets raised in the mock prairie dog colonies from three months of age survived longer than the release-cage group. Ferrets released at the site with fewer predators also survived longer. In addition, we released some wild-caught translocated Siberian ferrets, and they survived longer than the captive-raised ones.

Even though the captive-raised Siberian ferrets often exhibited the correct behavioral responses, they did not always perform them as efficiently as wild-raised animals. But we did have differential survival and several animals (both in the arena-raised group and translocated) that lived more than a month. Mortality will probably be heavy with any release of captive-raised animals. For a captive-raised carnivore the size of a black-footed ferret, it will be no easy task to locate and kill a prey item as large as a prairie dog and not be killed by a larger predator in the process. We hope that this research will help alleviate some of those problems, and facilitate future reintroductions of captive-raised black-footed ferrets back to the prairies of western North America.

This report was submitted by Brian Miller, Front Royal Conservation and Research Center, National Zoo.

Recommendation for Plant Genetic Resources System

The National Plant Germplasm System's (NPGS) decentralized structure has hindered its ability "to function as a coordinated, well-defined system with clear-cut leadership, responsibilities and authority," according to a National Research Council (NRC) committee report.

NPGS is a network of laboratories and experiment

stations responsible for preserving tissues, seeds and plants that comprise U.S. plant germplasm resources. Two agencies at the U.S. Department of Agriculture (USDA) and state agricultural experiment stations manage the system. However, this decentralized framework "constrains the resolution of long-standing needs and problems" according to NRC's Committee on Managing Global Genetic Resources.

To improve NPGS, the report makes recommendations in the following six critical areas: administration, germplasm acquisition and collection, facilities and personnel, the mission of the national system, information management, and research.

In the area of research, the report proposes establishing an advisory committee to "assess research needs, resources and accomplishments, and...consider research proposals from scientists." The advisory committee could also oversee external peer review at NPGS because current internal peer review "lacks scientific and technical rigor."

"Competitive grants should be used to fund research for which expertise is not available within the national system," the report suggests. Such a program could be managed by either NPGS or USDA's Cooperative State Research Service.

For more information about The U.S. National Plant Germplasm System, call the National Academy Press at (202) 334-3313 or 1-(800) 624-6242.

The above appeared in Research Review, University of Minnesota, November 1990.

Noah Project News

The Senate Appropriations Committee Report which accompanies the fiscal year 1990 Foreign Assistance Appropriations act, recommended that Agency for International Development (A.I.D.) undertake an initiative, to be called the Noah Project, whose purpose would be "to avert the decline in animal and plant species and the genetic variety within species." To begin this initiative, A.I.D. was asked to prepare a report which would examine the feasibility of supporting international preserves for endangered species.

In response to this legislation, A.I.D. has initiated an examination of current *ex situ* programs to preserve plant and animal genetic resources. Their report examines the importance of *ex situ* conservation in the context of global efforts being made to conserve biological resources and its relation to development assistance.

Conservation of genetic diversity is considered to be *ex situ* when seeds or embryos are preserved in gene banks outside their areas of growth. This approach is often contrasted with *in situ* conservation where plants and animals are preserved as populations in nature reserves.

A series of recommendations have been developed which provide a foundation to enhance the ability of *ex situ* collections to preserve genetic diversity especially for long-term

Noah news...

use by people and to coordinate more effectively these activities with current global efforts aimed at conserving diversity within reserves, parks and wilderness. The following recommendations should be carefully considered:

Recommendation 1 - Strategic Planning for *ex situ* Conservation of Biodiversity.

A mechanism should be established to develop "National *Ex Situ* Priority Action Plans." The donor community should (1) support priority national programs to enhance abilities for *ex situ* collection, conservation, documentation and introduction of useful plants (including trees) and animals; (2) consider supporting and initiating efforts of non-governmental organizations, particularly those linked to international organizations; and (3) continue to support the international agricultural research center efforts to collect, conserve and document crop genetic resources.

Recommendation 2 - Technologies for Improving *ex situ* Conservation.

The donor community should support a three-year program for institutes holding significant collections of biodiversity to regenerate old stocks, perform characterization, and document existing holdings. A.I.D. should develop a research module to coordinate and fund appropriate technologies to improve *ex situ* animal, plant and tree conservation.

Recommendation 3 - Training Programs for Developing Country Scientists

A.I.D. should (1) develop mechanisms whereby scientists from developing countries receive appropriate training and management skills to sustain national *ex situ* conservation programs; and (2) cooperate with other donors to design specialized short-term courses in *ex situ* conservation management.

Recommendation 4 - *Ex situ* Coordinating Mechanisms and the Development of Innovative Mechanisms

A.I.D. should ensure that the Agency Environmental Working Group considers *ex situ* conservation as complementary to *in situ* conservation of biological diversity. The donor community should (1) support and interface with efforts of WRI, IUCN, and UNEP as they lead the development of a World Strategy for Conserving Biodiversity; and (2) support cooperation and networking efforts of existing international organizations and of those being developed to fill new needs.

Recommendation 5 — Integrated Efforts to Enhance Global Information and Documentation Networks.

The donor community should (1) consider support to improve international information systems on *ex situ* conservation; and (2) request deposit of relevant documentation on *ex situ* conservation in an international library.

Przewalski Horse Progress Report

Following is a preliminary report submitted by John Knowles (CBSG Deputy Chair, Marwell Zoological Park) on progress in reintroducing Przewalski's Horse (*Equus przewalskii*) to Mongolia. A delegation went to Mongolia to examine release sites and confer with their Mongolian hosts. The non-Mongolian delegates were John Knowles, Claudia Feh, Jane Blunden, Christal Ibsen (film maker), David Sneath (anthropologist).

Our trip within Mongolia was hosted by the Mongolian Hunters Association who act as agents for the Ministry of the Environment of Mongolia. In early talks in Ulan Bator, it became obvious that they were committed to a reintroduction programme which would begin near Takin Tuz, a community adjacent to the Gobi B National Park. A 100-hectare enclosure is to be erected this winter with fencing provided by the Christian Oswald Foundation. We made it very clear that this had little interest to us if it did not lead to a much larger reintroduction programme aimed at complete, or almost complete freedom, for naturally-formed bands of horses. This point was well accepted. Gobi B Park consists of some 86,000 hectares with surrounding open desert steppe and which is separated from the much larger Gobi A. We were assured that Gobi A was not suitable for reintroduction of Przewalski Horses owing to its mountainous and even more arid nature. Gobi A is home to wild Bactrian Camel, Argali, and Ibex.

On 6 October 1990, our party left Altai in three Russian versions of World War II jeeps and drove through the Altai Mountains to Takin Tuz in the mountains. We were accompanied by Chuluun Baatar (translator and zoologist), Mr. Dorjraa (Secretary for Taki Reintroduction), and Mr. Khukhee (veterinarian) all of whom are members of the Committee for the Reintroduction of the Taki (Przewalski Horse). Takin Tuz is suitable at least for the 100-hectare site in that it is a centre to which hay is brought and where a good water supply is available because a dam is being built for a reservoir. We looked at the proposed 100-hectare site and made suggestions for slight alteration of the boundaries.

We then set off into the Gobi where we located two potential sites for a 10,000-hectare enclosure where there were good grass supplies and permanent water. There was also open desert which could be suitable for the horses, both in terms of vegetation and areas where they could escape from flies during the summer periods. Subsequent discussions indicated that one of these sites may be outside the Park boundary and it was close to the Chinese border. However, the first site was the one favoured, particularly by Claudia Feh.

During the course of our journey, we saw large numbers of Kulan of which there are thought to be some 2,000 in the Park. Both from discussions and observations, it would appear that they are more able to withstand arid conditions than are the Przewalski Horses.

Returning to Altai, we met the Chairman of the Gobi

Area Hunting Commission, Mr. Yadamkhuu, who expressed considerable enthusiasm for the reintroduction project. Many of the people that we met also expressed enthusiasm for the project and who were interviewed in their own language by David Sneath.

On return to Ulan Bator, we had meetings with the full State Commission for the Reintroduction of the Taki. The Commission was comprised of Mr. Dolonsuren (biologist), Mr. Davadorj (botanist), Prof. Danzin (parasitologist), and Mr. Bayandelgor (National Commission Secretary). Full minutes of this meeting will be available, but essentially the following was agreed upon:

Year 1 - Six yearling males will be transferred to the 100-hectare reserve hopefully in 1991. Their health before, during, and after the first year will be carefully monitored. During this year, a 10,000-hectare enclosure will be built with five- or seven-strand high-tensile wire.

Year 2 - The six males will be transferred to the 10,000-hectare site and 4.8 yearling animals will be placed in the 100-hectare enclosure.

Year 3 - The 4.8 animals received in Year 2 will be transferred to the 10,000-hectare enclosure and the six males removed. These six will be returned to the 10-hectare enclosure, unless we feel it necessary to send a further 4.8 animals. The fate of the six males would then have to be decided. It may be necessary to euthanize them, but they would have served their purpose as a test for the validity of the programme.

Year 3 - Year 10 - The groups of animals will be carefully monitored and should multiply sufficiently and form distinctive social bands so that the release of one band into the unfenced area will be possible.

It was agreed that the Mongolians would be responsible for transporting the animals from Moscow to the landing strip close to Takin Tuz. The Mongolians will be responsible for the erection of all fences, but the western participants will be needed to raise money for the high-tensile wire fence. An instructor on the erection of these fences may be needed for a short time.

In the meantime, much work needs to be done including a complete assessment of the botanical content of the area. Claudia Feh has already been provided with excellent botanical maps of Mongolia and we have been promised the cooperation of botanists from the Mongolian Academy of Science to check out the botanical content of the area on a year-round basis. Claudia returned to France with samples of vegetation for identification and analysis as well as faecal samples from domestic horses and Kulan.

Information was forthcoming on horse diseases and internal and external parasites which I will communicate to Mike Woodford as Chairman of the Veterinary Specialist Group of SSC.

The Mongolians plan to send a delegation to the United Kingdom in December to study fencing and our methods of keeping Przewalski Horses. An English-speaking veterinarian will also be sent to further his knowledge of immobilization

techniques, blood sampling, etc.

There can be no doubt of the enthusiasm and professionalism of the Mongolians with which we met for this project. Christal Ibsen took a great deal of video film from which she will make a pilot film to show to potential sponsors. I am hopeful that a great deal of money can be raised thereby.

Obviously, the area chosen for the reintroduction is close to where the animals are believed to have become extinct in the first place. However, the Mongolians believe that the area is still appropriate as the extinction of the Przewalski Horse was caused by attempts to catch more wild horses, hunting, the Sino-Soviet conflict in that area, and uncontrolled grazing by herds-men.

The Hunting Association, reinforced by the Minister, agreed that grazing would be limited in Gobi B which is in the process of becoming a World Heritage Site. It was also agreed that the only gelded domestic horses that would be allowed into the area.

The Boumans are setting up a semi-reserve some 100 km from Ulan Bator in a verdant area in association with the Mongolian Association for the Conservation of Nature and Environment. We were invited to see this, but did not have time. I do not perceive this as being either in conflict with or complementary to our project.

A further visit with a different delegation, but hopefully including Claudia Feh, would be welcome. This could be in conjunction with the shipment of the horses.



Przewalski Horses Released in China

On 17 April 1990, nine Przewalski horses were released from the Jimsar Wild Horse Breeding Center into the Gobi Desert. The Chinese held some 25 horses in captivity in the breeding center at Jimsar County. The horses apparently had adjusted well to the environment and were considered to be in good health prior to the release. Before being released, the horses were kept in a semi-wild environment to allow gradual adaptation to the wild. The progress of the reintroduction will be closely monitored by Chinese zoologists.

This report was obtained from "Chinese Wildlife."

Annual Report from the Madagascar Fauna Captive Propagation Group

Following is the Annual Report of the Madagascar Fauna Captive Propagation Group submitted by its chairman, David Anderson:

Foreign Technical Advisors

Ivoloina Field Station - The year's accomplishments by Andrea Katz and Charlie Welch have been numerous and very successful:

1. Inauguration as a Zoo - Andrea and Charlie worked in a well-coordinated fashion with the Water and Forests Ministry, who manage the zoo, to make certain they agreed upon strategy for rebuilding and opening the facility. This resulted in the Ministry adding staff to the facility and providing materials and equipment. They improved a road leading to the zoo and constructed a parking lot. An admission fee was established, a small fee for Malagasy visitors and a larger fee for foreign tourists. This has resulted in funds which will show the Water and Forests Ministry the advantages of maintaining a facility for tourism. It is hoped the funds can be used directly for improvements of the zoo in future years. The Ministry is exploring public transport from Tamatave to Ivoloina.

The inauguration itself was a formal ceremony held 22 June 1990 attended by the Minister of Water and Forests, local government officials, and 100 guests and dignitaries. The event was very successful, receiving much positive feedback.

2. Physical Facilities - Besides building four additional exhibits, Andrea and Charlie built six holding enclosures, a kitchen/storage facility, a new office/veterinary hospital, an educational pavilion, a zoo office with library/staff room and guest room, and a garden area. All of these facilities are modest, but they add greatly to the improvements of the field station and allow it to function much better both in its educational mission and in its conservation mission.

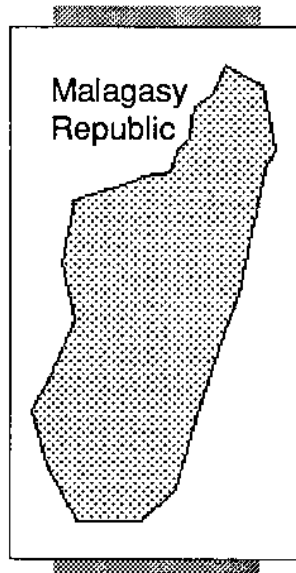
3. Education - A program has begun at the facility with both visiting public and school groups. A cartographer from Water and Forests Ministry provided animal graphics in Malagache, French, and English. The zoo staff were trained to interact with the visiting public. The zoo manager developed a basic tour for Malagasy children.

4. Conservation - The Department of Water and Forests has begun a stronger program confiscating lemurs with animals placed at Ivoloina as space allows. Andrea will encourage World Wildlife Fund to provide posters to help educate the populous about not keeping lemurs as pets.

Parc Tsimbazaza in Antananarivo - Fran Woods and Landes Bell have been in Antananarivo for five months. Again,

the important first step was establishing a relationship with the Ministry of Higher Education which operates the facility. The situation is changing because Parc Tsimbazaza is receiving autonomous status, making it an independent agency of the Ministry of Higher Education. The staff salaries still will be paid by the Ministry, however, the Director Voara Randrianansolo will raise funds for the remainder of the operation budget. He will submit a budget through the government next year and will privately raise funds in the United States, Europe and Japan.

Fran and Landes have accomplished a great deal during their short term and have created good liasons through the government.



1. Refurbishment - They have refurbished holding cages for five groups of lemurs. They have begun construction of a curator's office.

2. Master Plan for Reconstruction of Parc Tsimbazaza - They assessed the master plan created by the Missouri Botanical Garden along with members of MFG. They advised two architects working on the plan of the priorities for consideration. Wildlife Preservation Trust International sent Nevin Lash to Tsimbazaza and together they decided on four projects to implement for the zoo. Nevin also developed a master plan for the core animal collection.

3. Inventory/Records - An inventory has been completed by the new curator and a model animal history form devised. The curator may re-key the reptiles, which could change their inventory. The veterinary staff, with guidance from Dr. Heath, is developing a treatment form.

4. English Classes - A meeting was held with the American Cultural Center regarding English lessons for the staff. The cost is a flat hourly rate. Discussions will be held regarding eligible participants, logistics, and the possibility of staff contributing a small amount to defray the cost. Classes would be held at the Cultural Center with the Zoo providing transport.

5. Fran has developed protocols, necessitated by changes in the collection, for mouse lemur husbandry, for infant handrearing, and made measurement sheets for deceased mammals. At present, the protocols are in French, but will be translated into Malagache.

Veterinary Training - Dr. Susan Heath traveled to Madagascar for four weeks to train the veterinarians involved at Ivoloina Field Station and at Parc Tsimbazaza. Besides preliminary training of the veterinarians, Dr. Heath assessed veterinary needs and suggested physical changes in the facilities for improved animal care.

One benefit of this training is the potential for a publication "Lemur Medicine in the Third World" which will give advice on primate care using minimal facilities and supplies.

Another benefit is an effort to assess dietary requirements for lemurs in captivity in Madagascar and exploration of how to supplement the protein for animals in less than optimal circumstances.

Fran spoke with a representative of COROI, a large company there engaged in the manufacture of animal foods. She will collect samples of the ingredients in their diets and forward those to the U.S. for analysis. The representative asked for a copy of the analysis and seems interested in developing a primate product to specifications. A pelleted form is not available since there is no demand for pellets in Madagascar.

Faunal Species Programs

Lemurs

1. A global Lemur SSP is being established and can serve as a model for all other taxa to be worked with in Madagascar, and potentially in other countries.

2. Placement of Animals - The first pair of *Propithecus* to be placed in a facility outside Madagascar other than Duke Primate Center was transferred in October. The pair went to the Los Angeles Zoo. Another pair is expected to be moved in the early Spring.

There has been little response from the request to place specimens of *Lemur mongoz* and *Mirza*. I would appreciate each MFG institution acknowledging whether space can be made available for specimens of these species.

3. The list of six species that need immediate captive assistance movement was proposed during the San Antonio meeting in 1989 and adopted through the Primate Specialist Group. To date, over some 20 specimens of these species either have been imported to the United States and Europe or await importation. This number or more is expected to be moved also in 1991.

4. The following species are being handled in formal or informal studbooks. The informal studbooks will be formalized through application to IUDZG once the numbers of animals are sufficient.

Lemur mongoz - Mike Clark, London Zoological Society

Daubentonia madagascariensis - Jersey Wildlife Preservation Trust

Propithecus (all species) - Duke Primate Center

Lemur macaco (including *L. m. flavifrons*) - Ingrid Porton, St. Louis Zoo

Lemur coronatus - Jean-Marc Lermould, Zoo Mulhouse (may be given to Uta Hick, Cologne Zoo).

Lemur rubriventer - Zoo Mulhouse

Hapalemur (all species) - Jean-Marc Lermould, Zoo Mulhouse

Lemur fulvus (including *L. f. rufus*, *albifrons*, *sanfordi*, *collaris*, *fulvus*) - Duke Primate Center

Lemur catta - Ingrid Porton is identifying individual

Mirza and *Cheirogaleus* - Duke Primate Center

Microcebus - Request will be made to Bristol Zoo

Other Mammals

1. Tenrec - Ed Gould of the National Zoo has communicated with MFG and is working on aquatic Tenrecs. One of his colleagues, Bela Demeter, spent time in Parc Tsimbazaza training zoo staff in husbandry of tenrecs. Dr. Gould would like to know if other zoos would be interested in a captive breeding program for the aquatic tenrec.

2. There is a pair of *Echinops* available at a facility in Canada. They were legally imported and are very healthy. If there is a party interested in these tenrecs, please contact me for details.

Mike Hutchins is proposing through WCI to do a study of bats in Madagascar which would occur next year.

There is interest now in working with *Galidia glegans* and other mammal species.

Birds

The Avian Interest Group has targeted Madagascar for work with some priority species. Three steps are involved in working with the birds at the moment. First is identifying the priority of species which need captive assistance. This is being done from field data through the ICBP and from information Bruce Bonke at St. Louis and Kevin Bell at Lincoln Park are gathering.

The second part of the program will be capture of specimens of priority species and acclimating them to captivity in Madagascar. Once identification for priority species has occurred, appropriate facilities will be constructed in Ivoloia and Parc Tsimbazaza to hold the birds.

The third step will be sending specimens outside Madagascar to MFG facilities for full-scale breeding programs, similar to those being done with lemurs.

It should be noted that the long-awaited "Guide to the Birds of Madagascar" by Olivier Langrand is in publication and is available through Yale University Press.

The Peregrine Foundation has contacted MFG to discuss a breeding program in Madagascar. Richard Watson from the Peregrine Foundation is traveling to Madagascar and will talk with Fran Woods about this project. The results of that discussion will be forwarded.

Reptiles

A report has been circulated from John McLain and John Behler, members of MFG who traveled to Madagascar and made an initial assessment of reptile needs.

A solution for the 250 radiated tortoises held at the Ivoloia Field Station is being discussed for action next year.

The Reptile Interest Group will be asked to support construction of a release station, likely in the Beza Mahafaly area, to introduce approximately 150 of these animals. This number is an approximation of specimens per unit area that might be released without population problems and territorial problems. The Reptile Interest Group will explore further the location and logistics for this release. The seventy smallest tortoises will

Madagascar...

be retained at the facilities in Ivoloia. The thirty remaining animals may be requested for import to the United States, Great Britain or Europe to MFG institutions for part of the radiated breeding program. *Sanzinia* (2.2), including a gravid female, are being exported for the captive breeding program.

Fish

Peter Reinthal and Melanie Stiasny of the American Museum traveled to Madagascar and found one form of cichlid they thought previously existed appears to be extinct. However, one species previously thought extinct was rediscovered.

They plan soon to place captive bred F1 specimens of *Paratalapia polli* in institutions in the U.S.. They have found some holding tanks in Madagascar and will try to initiate a triage program for brood stock from endangered forms.

Les Kaufman from the New England Aquarium believes one of the crucial projects relating to fish in Madagascar would involve preservation of watershed areas.

Projects

Publications - "The IUCN Red Data Book for Lemurs of Madagascar and the Comoros" has been published partly with funds from the MFG. The MFG helped with publication cost for a comic book printed both in French and in Malagache which is now being distributed.

Funding - A World Bank application is still on hold because there are discussions within World Bank how to implement some of their programs. There is a new project manager for Madagascar and David Anderson will make contact with him to keep our application current.

MacArthur Foundation - MFG is making application through the Brookfield Zoo to the MacArthur Foundation for a large grant to continue and expand projects in Madagascar. This would permit funding for a third station in Madagascar as was discussed through the Amendment of the Madagascar Accord.

Vehicle Donation - A special thanks goes to the Jersey Wildlife Preservation Trust and to Wildlife Preservation Trust International for making available to MFG a Toyota Land Cruiser late this year. This vehicle currently is being used by the crew from JWPT but after that it will be turned over to the MFG for our use. This saves us funds that were marked for a vehicle in Parc Tsimbazaza and will thus allow us to put those funds into other operations in Tsimbazaza.

Training Programs

1. Overseas Zoo Training through Smithsonian Institution - The Smithsonian Institution's National Zoological Park developed several years ago a training course for animal management. Fran Woods and Andrea Katz are submitting applications to Dr. Chris Wemmer for this course in 1992 in Parc Tsimbazaza and/or Ivoloia. This would coordinate well with ongoing training programs.

2. Veterinary Training - The MFG will follow up the veterinary training done by Dr. Susan Heath. Next year either Dr. Jean-Marc Lernoald or Dr. Heath will be recruited for a second phase of veterinary training.

Kangaroo Status Review Initiated

The U.S. Fish and Wildlife Service announced initiation of a formal status review of three species of kangaroo classified as "threatened" under the Endangered Species Act: the red, the western gray, and the eastern gray (except one subspecies that is classified as endangered).

The results of the review will be used to decide whether to maintain, modify, or repeal a "special rule" which currently allows importation of kangaroo products, or whether removing these species from the Federal List of Endangered and Threatened wildlife should be considered.

The announcement is accompanied by the release of a Service report, "Review of Kangaroo Management—Australia, March 1990." That document indicates many kangaroo popula-



tions appear healthy and recommends consideration be given to removing these species from the list of threatened species protected under the Endangered Species Act.

The investigation was undertaken, in part, to consider concerns raised in a petition filed late last year by Greenpeace USA. The petition sought to reinstate a former ban on importation of kangaroo products into the United States. The petitioners contended that management of the kangaroos by the Australian states was not effective and that population data were inadequate.

In March 1990, the U.S. Fish and Wildlife Service sent three professionals to Australia to obtain information and hear all Australian points of view regarding the issue. The team met with government scientists and representatives, as well as private individuals, businessmen, and conservation organizations. They also visited field sites and commercial facilities. The report compiled by the fact-finding group contains a number of recommendations, including improved survey methods, better tagging and tracking of skins, and increased emphasis on investigation of wildlife crime.

The kangaroo family contains 54 separate species, 13 of which are listed by the U.S. Government as endangered and 3 as threatened. Members of the family include the three threatened kangaroo species, as well as wallaroos, rat-kangaroos, tree kangaroos, and wallabies. Although the red, western gray, and eastern gray species are listed as threatened by the United States, they are not considered endangered or threatened by the Australian government, with the exception of the subspecies of eastern gray kangaroo considered endangered by both governments.

Kangaroos are found throughout Australia. The red kangaroo occurs across the entire continent, the western gray kangaroo is found mainly across the southern part of Australia, and the eastern gray kangaroo occurs in the eastern three states, with a limited extension into South Australia and Tasmania.

The Service listed these species of kangaroo as threatened in December 1974, with a special rule allowing for commercial import of kangaroos, their parts, and products once effective Australian management plans were established. In April 1981, the Service began allowing imports on a trial basis. In April 1983, the Service proposed to continue allowing imports and to delist the three species. The Service subsequently published a rule allowing the continuation of imports, but withdrew its proposal to delist the species because of rapid population declines associated at the time with a prolonged and widespread drought in Australia. By 1987, the combined population estimates for the three species had essentially returned to the pre-drought numbers of more than 18 million.

As part of the current status review, the Service is soliciting relevant data, comments, and any other information on the status of the three species and their management. Of particular interest is information on the detection of illegal trade, the magnitude of noncommercial harvest, and effects of recent floods. Comments concerning this status review and requests for copies of the Greenpeace petition or Service time report should be submitted to: Office of Scientific Authority, Room 725, Arlington Square, U.S. Fish and Wildlife Service, Washington, DC 20240. For further information, contact Dr. Charles W. Dane, Chief, Office of Scientific Authority, at 703-358-1708.

Spix Macaw Conservation

The following information was taken from an article entitled, "The conservation of Spix's macaw" by Tony Juniper and Carlos Yamashita (*Oryx* 24(4), 1990).

Spix's macaw is one of the least known of the Neotropical parrots. Since it was first collected on the banks of the Rio Sao Francisco in 1819, the species has been known from a small collection of museum specimens, sight records from a handful of observers, and a tiny captive population. Reports have led several authors to conclude that the species was extinct in the wild. Recently, however, there has been doubt concerning the wild status of Spix's macaw. Rumors of birds sold on the black market and reports of Spix's macaws in the wild led to speculation that a hitherto unknown population survived.

It is widely believed that Spix's macaw possessed a range encompassing a 300,000-sq-km area in the interior of northeastern Brazil. This is a vast area covering three major vegetation types and suggested that Spix's macaw was a generalist species capable of tolerating a range of conditions. However, recent evidence indicate that a favored habitat feature of the last known wild birds was the, *Tabebuia caraiba*, gallery woodlands

fringing the seasonal watercourses that traverse the caatinga vegetation in northeastern Bahia state. Evidence gathered in this region strongly indicated that the existing available habitat is a mere remnant and that this explains the original rarity of the species and its extreme vulnerability to trapping. These findings further emphasize the importance of the small number of specimens in captivity but also highlight the need for habitat conservation measures, a consideration not previously thought important in the struggle to save Spix's macaw.

There are four main pressures on the species: direct hunting; African bees; trapping for the black market in live birds and habitat loss. In July 1990, only a single bird remained from a population of around 30 pairs. In recent years, several initiatives have been launched in an attempt to save Spix's macaw from extinction. In August 1987, a meeting was convened at Loro Parque in Tenerife in the hope that a cooperative captive breeding effort could be established. Since then, several field surveys have been undertaken to try and find further wild birds and in October 1989 plans were laid for the establishment of a recovery committee, backed in law by the Brazilian Government, with representatives of interested parties meeting to arrange the development of captive-breeding programme (some 15 birds are held in captivity around the world). In June and July 1990, a further field survey was carried out under the auspices of the International Council for Bird Preservation. Information collected during this expedition forms the basis of the recommendations outlined below. These recommendations are now being actively pursued by ICBP.

1. The last wild bird must be protected from trappers. If the species is allowed to become extinct in the wild, it will be far more difficult to reintroduce captive-bred individuals. The recovery programme for the Puerto Rican parrot, *Amazona vittata*, has demonstrated the great value of maintaining a wild population and work in Arizona on the reintroduction of thick-billed parrots, *Rhynchopsitta pachyrhyncha*, has highlighted the immense difficulty of returning captive-bred birds to the wild in the absence of an established population. Guards, preferably armed, must be posted in the locality frequented by the last bird.

2. A mate should be found for the last wild bird. A suitable partner should be found from among the captive birds for the last wild individual and every effort must be made to encourage successful breeding in the wild. The early release of other wild-caught adults should also be planned.

3. Habitat conservation measures must be instigated. The *T. caraiba* gallery woodlands favored by Spix's macaw are not regenerating. Goats, sheep and cattle currently eat all of the young trees and as a consequence the habitat is gradually disappearing. Sections of the seasonal watercourses should be fenced for 5-10 year periods to enable young trees to grow out of the reach of domestic stock. Ultimately, this kind of management will be of benefit to the farmers since the mature trees provide a renewable source of food for domestic stock during the dry season. It is felt that the *T. caraiba* gallery woodlands merit conservation in their own right due to their very limited extent.

Spix macaw...

4. A fully up-to-date captive breeding facility should be established in the area where the last wild birds were known. In order to maximize the productivity of the tiny captive population, a technologically-advanced breeding facility should be established near Curaca. This should be properly funded and run by an internationally-recognized expert on macaw husbandry. Several benefits would result if such an initiative is taken, including: a 'neutral' site would encourage other aviculturists to send their birds to the scheme; the climate and surroundings would facilitate greater breeding success and acclimatize the birds for ultimate release; benefits for both the wild birds and those held in captivity would be gained through the opportunity to manage both sets of birds together. Such benefits have proved central to the successes achieved with the recovery effort for the Puerto Rican parrot; although generally very poor, the local people were found to be very helpful and genuinely interested in the macaw. A conservation effort set up locally would promote goodwill and contribute greatly to the ultimate protection and conservation of wild birds.

5. The working group established under Brazilian law

for the recovery of Spix's macaw needs to broaden its remit to accommodate the new situation created by the discovery that a single wild bird survives. We commend the points above to the group, which should be responsible for the overall management of the project and should ensure that all major decisions reflect the priority conservation needs of the species.

The main (ultimate) cause for the loss of Spix's macaw in the wild was the live bird trade. This pressure was particularly serious since the wild population had been depleted through the loss of habitat. Other less serious factors such as introduced bees and shooting for food may have hastened the decline but were probably not instrumental in bringing about the extinction.

Increasingly, as time passes, the chances of saving Spix's macaw from extinction are reduced. The multiplicity of factors that led to the virtual extinction of this species in the wild will require a correspondingly diverse range of measures to re-establish it. New information concerning the threats to the habitat of Spix's macaw is particularly disturbing and it is obvious that an integrated approach involving both captive breeding and ecological expertise (as well as better enforcement of wildlife trade laws and education of local people) will be needed if a serious attempt is to be made to secure the species in the wild.

International Panda Workshop and Conference to be Held



On 2-7 June 1991, an international conference entitled, "The Pandas: A Conservation Initiative" will be held in Washington, D.C., USA (see Meetings for details). The conference will address conservation issues for both the Giant and the Red Panda.

The goals of this conference and workshop are:

1. To develop conservation strategies for the giant and red panda that will ensure, with some high degree of probability, the long-term survival of these species using all available information on natural history, biogeography, life history, threats to their existence, and status of wild and captive populations.

2. To identify immediate and long-term conservation requirements.

3. To develop and consolidate the international captive breeding programs for each species.

4. To publicize, through a public symposium, the plight of the two species and our recommendations developed to prevent their extinction.

5. To provide technical expertise for development and maintenance of long-term conservation and management strategies for two species. We are also eager to develop improved working relationships with Chinese scientists and government officials to enhance the conservation of these species.

6. To develop a strategy for financial and logistical support to carry out research and conservation recommendations.

Participants will include: field and zoo biologists involved in long-term research and breeding programs for each species; members of government organizations in China and elsewhere responsible for protection of endangered species; representatives of non-governmental organizations involved in providing support for the conservation strategies being developed; members of national and international zoo associations with interest in pandas; managers of the species in the wild and captivity; and individuals with particular expertise in the development of species long-term conservation strategies.

Since the biology, habitat requirements, and ranges of the pandas overlap, the participants are likely to have an interest in both species. Thus, having the workshops at the same time will be the most efficient means of dealing with the issues and will permit the sharing and application of experiences between species.

From this initiative, we hope to produce conservation strategies, with clear timetables and schedules, that can be formally adopted by relevant governments and conservation organizations (e.g. IUCN). These documents will be prepared during the workshop and will be revised as necessary until agreement on content can be reached.

The conservation strategy will be initiated from materials provided prior to the meeting documenting the status of the species in the wild (number of reserves; estimated number of

animals in the wild; threats to the species in the wild; number of specimens needed to prevent extinction) and in captivity (inventory of all specimens in captivity; analysis of mortality and natality from historical records). Information on natural history, behavior, biogeography, genetics, physiology, nutrition, and life history characteristics of the species will be included. Priorities for research and management action will derive from the synthesis of available information, and results suggesting the degree of population vulnerability for each species will emerge from the computer simulations.

A public symposium and press conference at the National Zoological park on the sixth day will present the latest developments in research and conservation of the red and giant pandas and will summarize the conservation strategies and action plans adopted by the workshops. These events are expected to focus significant media attention on the species. Finally, a volume on the natural history and conservation of the red and giant panda will be produced.

IUCN Resolution on the Giant Panda

RECALLING Resolution 17.50 of the 17th Session of the IUCN General Assembly (1988) about conservation of the Giant Panda (*Ailuropoda melanoleuca*);

RECALLING that Resolution 17.50 specifically recommended adoption of a long-term strategic and tactical conservation plan for the Giant Panda and recommended that the People's Republic of China consider that any exhibition of Giant Panda should only be adjunct to and completely compatible with an international captive breeding programme for the species;

DEEPLY CONCERNED that a continuing fragmentation and diminishment of Giant Panda natural habitat is reported and that the captive population has not been shown to be self-sustaining;

CONCERNED that exhibit loans, or even loans of single pairs of Giant Panda for breeding purposes, may diminish the reproductive potential of the captive population in the absence of a global breeding strategy;

NOTING that an international conference on a global strategy for Giant Pandas will be held at the National Zoological Park,

Smithsonian Institution, Washington, D.C., United States of America in June 1991;

The General Assembly of IUCN, at its 18th Session in Perth, Australia, 28 November - 5 December 1990:

1. STRONGLY REAFFIRMS Resolution 17.50;

2. URGES all holders of Giant Pandas to participate in an animal-by-animal assessment of the captive population of



the Giant Panda to determine their genetic background and physical and behavioral competence in order to identify the best potential breeders for more successful management of the Giant Panda in captivity;

3. FURTHER URGES full participation in the Washington conference in June 1991 to develop a global breeding strategy, population visibility assessment, and action plan for the species; including all Giant Pandas in captivity;

4. URGES all involved agencies and individuals in the People's Republic of China to strengthen co-operative research and propagation programmes for captive Giant Pandas;

5. RECOMMENDS a moratorium on the acquisition of Giant Pandas from China by parties outside the People's Republic of China until July 1991, at which time the conclusions reached at the Washington conference should guide placement of captive Giant Pandas.

IUCN/SSC List of Action Plans and Related Publications

The below list of publications can be obtained by sending a check or international money order to: IUCN Publications Services Unit, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom. Please add 15% to the total order price for shipping and handling. A complete catalog of IUCN publications can also be obtained by writing to the above address.

Action Plan for African Primate Conservation: 1986-1990. Compiled by J. F. Oates and the IUCN/SSC Primate Specialist Group, 1986, 41 pp., £7.50, U.S. \$15.00.

Action Plan for Asian Primate Conservation: 1987-1991. Compiled by A.A. Eudey and the IUCN/SSC Primate Specialist Group, 1987, 65 pp., £7.50, U.S. \$15.00.

Antelopes. Global Survey and Regional Action Plans. Part 1. East and Northeast Africa. Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1988, 96 pp., £7.50, U.S. \$15.00.

The Kouprey. An Action Plan for its Conservation: Compiled by J. R. MacKinnon, S. N. Stuart, and the IUCN/SSC Asian Wild Cattle Specialist Group, 1988, 19 pp., £5.00, U.S. \$10.00.

Dolphins, Porpoises, and Whales. An Action Plan for the Conservation of Biological Diversity: 1988-1992. Second Edition. Compiled by W. F. Perrin and the IUCN/SSC Cetacean Specialist Group, 1989, 28 pp., £5.00, U.S. \$10.00.

Weasels, Civets, Mongooses, and their Relatives. An Action Plan

IUCN/SSC publications...

for the Conservation of Mustelids and Viverrids. Compiled by A. Schreiber, R. Wirth, M. Riffel, H. Van Rompaey, and the IUCN/SSC Mustelid and Viverrid Specialist Group, 1989, 99 pp., £7.50, U.S. \$15.00.

Antelopes. Global Survey and Regional Action Plans. Part 2. Southern and South-central Africa. Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1989, 96 pp., £7.50, U.S. \$15.00.

Asian Rhinos. An Action Plan for their Conservation. Compiled by Mohd Khan bin Momin Khan and the IUCN/SSC Asian Rhino Specialist Group, 1989, 23 pp., £5.00, U.S. \$10.00.

Tortoises and Freshwater Turtles. An Action Plan for their Conservation. Compiled by David Stubbs and the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1989, 48 pp., £7.50, U.S. \$15.00.

African Elephants and Rhinos. Status Survey and Conservation Action Plan. Compiled by D. H. M. Cumming, R. F. du Toit, S. N. Stuart, and the IUCN/SSC African Elephant and Rhino Specialist Group, 1990, 73 pp., £7.50, U.S. \$15.00.

Foxes, Wolves, Jackals, and Dogs. An Action Plan for the Conservation of Canids. Compiled by J. R. Ginsberg, D. W. Macdonald, and the IUCN/SSC Canid and Wolf Specialist Groups, 1990, 116 pp., £10.00, U.S. \$20.00.

The Asian Elephant. An Action Plan for its Conservation. Compiled by Charles Santiapillai, Peter Jackson, and the IUCN/SSC Asian Elephant Specialist Group, 1990, 80 pp., £7.50, U.S. \$15.00.

Otters. An Action Plan for their Conservation. Edited/Compiled by Pat Foster-Turley, Sheila Macdonald, Chris Mason, and the IUCN/SSC Otter Specialist Group, 1990, 126 pp., £12.50, U.S. \$25.00.

Antelopes. Global Survey and Regional Action Plans. Part 3. West and Central Africa. Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1990, £10.00, U.S. \$25.00.

Rabbits, Hares, and Pikas. Status Survey and Conservation Overview. Compiled by J. Chapman, J. Flux and the IUCN/SSC Lagomorph Specialist Group, 1990, £12.50, U.S. \$25.00.

Species Conservation Priorities in the Tropical Forests of Southeast Asia. Edited by R.A. Mittermeier and W.R. Konstant, 1985, 58 pp., £7.50, U.S. \$15.00.

Priorites en Matiere de Conservation des Especies a Madagas-

car. Edited by R. A. Mittermeier, L. H. Rakotovo, V. Randrianasolo, E. J. Sterling, and D. Devitre, 1987, 167 pp., £7.50, U.S. \$15.00.

Biology and Conservation of River Dolphins. Edited by W. F. Perrin, R. K. Brownell, Jr., Zhou Kaiya, and Liu Jiankang, 1989, 173 pp., £10.00, U.S. \$20.00.

Rodents. A World Survey of Species Conservation Concern. Edited by W. Z. Lidicker, Jr., 1989, 60 pp., £7.50, U.S. \$15.00.

The Conservation Biology of Tortoises. Edited by I. R. Swingland and M. W. Klemens, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, and the Durrell Institute of Conservation and Ecology, 1989, 204 pp., £12.50, U.S. \$25.00.

Biodiversity in Sub-Saharan Africa and Its Islands: Its Conservation, Management and Sustainable Use. Edited by S. N. Stuart, R. J. Adams, and M. D. Jenkins, 1990, £12.50, U.S. \$25.00.

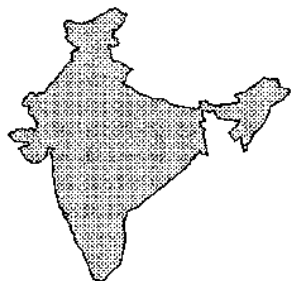
IUCN Red List of Threatened Animals. Prepared by IUCN World Conservation Monitoring Centre, 1990, £7.50, U.S. \$15.00.



Conservation Modeling Book Published

A new paperback edition of "*Building Models for Conservation and Wildlife Management*" by Starfield and Bleloch will be available in January, 1991. As an introduction to building models for conservation, the book is described as being "...highly accessible even to those who have no mathematics, statistics, or programming skills" (Bioscience 38(6), 1988) and is "...worth reading by beginning or experienced modelers alike and by those biologists and conservationists who have heard about modeling, but are not clear as to what it's all about" (Prairie Naturalist 20(3), 1988).

The price of the book is \$19.50 (U.S.) plus \$2.00 postage and handling. It can be obtained by writing The Burgess Press, 7110 Ohms Lane, Edina, MN 55435, USA. Credit card orders will be taken by phone (1-800-356-6826) or fax (612 831-3167).



Indian Zoo News

Zoo Management Training

The first training course in Zoo Management for upper-level zoo personnel was held at Nandankanan Zoo from 26 November to 8 December 1990. The ten-day "capsule course" provided an overview of all the major aspects of zoo management, including I.S.I.S. membership, studbooks, safety, and crisis control. The course is part of a comprehensive and long-term zoo consultancy project funded by the Ministry of Environment, Government of India. It includes making a complete status and management survey of zoological facilities in the country as well as organizing systematic training programs for various levels of in-service zoo personnel.

The Zoo Consultancy Project has been authored by Dr. J. H. Desai, Director and Assistant Professor, Wildlife Institute of India, and is part of the Institute's ongoing wildlife training and advisory service.

The recent course in Zoo Management answered a long-felt need as evidenced by the turnout of twice as many candidates as expected. Zoo Directors from the remote north-eastern states of Arunachal Pradesh and Sikkim down to Trivandrum, Kerala at the very tip of southern India attended the course. Mr. S. K. Patnaik, President of the Indian Zoo Directors' Association, hosted the group at the Nandankanan Zoo.

Asiatic Lion News

Dr. Ravi Chellan has completed his three-year study of Gir lions and has produced a comprehensive report. He recommends translocation of animals to alternate sites as a solution to the problem of the expanding animal population in the limited area of Gir Forest. Lions are straying into the densely-populated villages which surround the forest leading to human/animal conflicts.

Mr. P. P. Raval reports that work on the Regional Studbook for the Asiatic lion is progressing. Raval proposes to visit each zoo reporting Asiatic lions and collecting blood samples for analysis to insure purity of each animal to be included in the Studbook. In the last year several zoos have reported births of pure Asiatic lion cubs. Raval also reports that permission has been granted to tranquilize two animals from Gir for collecting samples for genetic analysis.

Regional Studbook for Himalayan Musk Deer

A status and management survey of Himalayan Musk deer has been completed and a studbook produced. Three facili-

ties in India are maintaining and breeding Himalayan Musk deer: the Musk Deer Farm, Kufri, Himachal Pradesh (7.3); Musk Deer Research Centre, Dharmghar Uttar Pradesh (13.15); and Musk Deer Breeding Centre, Kanchula Kharak, Uttar Pradesh (8.4). The survey was conducted by Zoo Outreach Organization, funded by the San Diego Zoological Society. The Studbook was put onto computer by the National Foundation for Research in Zoological Gardens, Netherlands whose personnel figured the inbreeding coefficient and supplied "recommended pairings" in time for this year's breeding season. The Report is available from Z.O.O., Box 1683, Peelamedu, Coimbatore 4, India for \$20.00 (U.S.).

Survey of Visitors' Attitudes Toward Wildlife

A unique survey of visitor attitudes toward wildlife as influenced by zoo size and quality is being attempted by Mr. Tamilarasan in representative zoos in the state of Tamil Nadu. He will survey visitors at three different zoos over a period of four months. The survey will cover visitor awareness, prejudices, response to conservation publicity, response to zoo design as well as animal welfare issues. Mr. Tamilarasan is a student at the A.V.C. College of Mayiladuturai, Tamil Nadu, Department of Zoology, Division of Graduate Studies in Wildlife Biology.

Manipur Brow-antlered Deer Eartagged

Two Manipur brow-antlered deer born in Calcutta Zoo this season have been successfully eartagged. The total results of this year's breeding are not yet available, but births have been reported at Ahmedabad, Hyderabad, Delhi, Calcutta and Madras zoos.

Paignton Zoo Begins Training Program for Indian A.M.C. Candidates

The Paignton Zoological and Botanical Gardens this year begins a new program for Indian zoo personnel completing the Animal Management Correspondence Course. The candidate will carry out his or her major project work at Paignton Zoo and work alongside the zoo staff in all departments. A lecturer in the A.V.C. College Wildlife Biology Division was selected for the first year. In subsequent years, only persons working directly in zoos and having completed their Animal Management Correspondence Course will be considered. There are over two dozen candidates presently taking the Animal Management Course in India.





News from the Australasian Species Management Program

The recent restructuring of the Australasian Zoo industry has resulted in many acronyms that have been deleted or emerged. This has led to some confusion on what the new entities are, what they do, and who is represented in them. The following is intended to clarify the current position as well as update readers on recent events in the species management scene in Australasia.

ARAZPA is the Australasian Region Association of Zoological parks and Aquaria. It is the professional zoo association of the region drawing its membership from both private and statutory zoos and aquaria. It is to be incorporated in 1991. The officers of ARAZPA are: President - Aura Mumaw, Director, Auckland Zoo, Motions Rd., Western Springs, Auckland 2, New Zealand. Secretary: Gaye Hamilton, Assistant Director, Melbourne Zoo, P.O. Box 74, Parkville, Victoria 3052, Australia. Treasurer - Bob Grover, Director, Symbio Koala Gardens, P.O. Box 77, Hellinsburgh, N.S.W. 2508, Australia. .

COGBAZ is the Council of Governing Bodies of Australasian Zoos. COGBAZ is the body representing the governing boards of the statutory zoos in Australia and New Zealand. Chairman - Paul Garland, Director, Orana Park Wildlife Trust, P.O. Box 5130, Papanui, Christchurch, New Zealand.

ASZK is the Australasian Society of Zoo Keepers. There are no changes to this well-established body representing zoo keepers in the region.

ASMP is the Australasian Species Management Programme. It is the regional equivalent to the SSP and EEP, administered by the Conservation Coordinator under the direction of the SMCC (see below). Its mission Statement is "To contribute to conservation, regionally and internationally, by assisting in the preservation of biodiversity and the prevention of species extinctions through the cooperative regional management of wildlife."

SMCC is the Species Management Coordinating Council. It is a six-member Council responsible to ARAZPA and COGBAZ for the administration of the ASMP. This body will be incorporated in 1991 and provide species management coordinating services via its Conservation Coordinator on a contractual basis to participating private and public institutions. Chairperson - Richard Jakob-Hoff, Senior Curator, Auckland Zoo, Motions Rd., Western Springs, Auckland 2, New Zealand. SMCC members are: John De Jose, Director Perth Zoo, Western Australia; Paul Garland, Director, Orana Park Wildlife Trust, New Zealand; Graham Mitchell, Director, Melbourne Zoo, Victoria; Graeme Phipps, General Curator, Taronga Zoo, New South Wales; and Kevin Langham, Manager, Tipperary Wildlife Sanctuary, Northern Territory.

Conservation Coordinator

The most significant event for the future of the ASMP is the appointment by the SMCC of the Conservation Coordinator, Dr. Barbara Porter. Barbara will take up her appointment officially on 7 January 1991 and be based in an office in Perth, WA.

Selected from an international field of 31 candidates, Dr. Porter will bring to the position experience and expertise in the fields of conservation biology, genetics, computing, and communications as well as a strong motivational commitment to conservation. Dr. Porter has qualifications in zoology and natural resource management which have involved studies on management strategies for endangered Australian fauna, kangaroo biology, and animal nutrition and physiology. Research activities have focused on the ecology, breeding biology, and management of the oblong tortoise *Chelodina oblonga*, breeding behavior of yellow-billed spoonbills, *Platalea flavipes*, and the ecology of insectivorous bats. Dr. Porter also has extensive teaching experience in environmental and life sciences including genetics, population dynamics and conservation biology.

The Conservation Coordinator will be responsible to the SMCC for the effective implementation and coordination of ASMP objectives. Until an office and associated address and telephone number are established, all communication to the Conference Coordinator should be addressed to Dr. Porter, c/o Perth Zoo, Labouchere Road, South Perth, Western Australia.

ARAZPA Conference

The first annual conference of the Australasian Regional Association of Zoological Parks and Aquaria will be held at the Western Plains Zoo in Dubbo, N.S.W. from 5th-10th May 1991. There will be six workshops to address regional species management objectives. Each workshop will have half a day allocated and will run concurrently as follows: Birds (G. Phipps), Marsupials (P. Christie), Carnivores (D. Langdon), Perissodactyles (K. Langham), Primates (A. Embury), and Artiodactyls (P. Garland). These workshops are intended to clearly identify the regional species management priorities of participating institutions and, in conjunction with a review of species based on current ASMP categories, will lay the foundation for a rational, cost-effective species management programme for the region.

Departure of Dr. Robert Baker and Graeme George

All members of the Australasian and global zoo community were saddened by the resignation of Dr. Robert Baker

from his post as Director of Adelaide Zoo under very stressful personal circumstances. As Australasian Trustee on the Board of ISIS and recent past president of the (now defunct) Association of Zoo Directors of Australia and New Zealand, Dr. Baker was well known and respected in the international zoo community. His commitment to species management in particular will be a sad loss to Australasian zoo conservation. His resignation left a vacancy on the Species Management Coordinating Council which has been filled by the Director of Melbourne Zoo, Dr. Graham Mitchell.

Equally missed is Graeme George whose position of Regional Coordinator for the ASMP was abolished in July 1990 as a consequence of the restructuring of the Programme. His contribution to the development of the ASMP since its foundation and his enthusiastic dedication to its implementation has been of inestimable value. Like Robert Baker, Graeme George is well known in the international zoo community and came to be the embodiment of the Australasian Species Management Programme in the eyes of that community. Graeme decided not to apply for the new position of Conference Coordinator and is pursuing a freelance consultancy career in the rural village of Healsville.

This report was submitted by Richard Jakob-Hoff, Chairperson, Species Management Coordinating Council.

Southeast Asian Zoo Association Formed

At the 3d Conference of SEA Zoos held 22-25 October 1990 in Bogor, Indonesia, it was resolved to establish the South East Asian Zoos Association. Association membership is open to zoos, aquariums, safari parks, bird parks, reptile parks, insectariums, herbariums, and other wildlife collections open to the public or involved with captive breeding. The Association will concentrate its efforts on native flora and fauna, particularly endangered species. Cooperative breeding programs will be based on regional studbook data. Information exchange will be facilitated by a regional zoo bulletin. Currently, the participating countries are Singapore, Thailand, Malaysia, Hong Kong, the Phillipines, and Indonesia.



ASMP Adopts SSP Logo

The Australasian Species Management Programme (ASMP) has adopted the rhinoceros logo of the Species Survival Plan (SSP) that originated with the American Association of Zoological Parks and Aquariums and was subsequently adopted by the Europaisches Erhaltungszucht Programme (EEP). This logo has been proposed as the global logo for all organized, regional captive propagation groups.

AAZPA Conservation News

AAZPA/IUCN CBSG Working Relationship

The American Association of Zoological Parks and Aquariums (AAZPA) and the International Union for the Conservation of Nature and Natural Resources' Captive Breeding Specialist Group (CBSG) have agreed on a format for their working relationship. A memorandum of understanding (MOU) has been prepared which outlines various ties and lines of communication between the two organizations. The AAZPA Director of Conservation and Science will become a member of the CBSG's Global Conservation Coordinators Committee. The document was approved by the AAZPA Board of Directors, AAZPA Executive Director, Chairman of the WCMC, and Chairman of the CBSG at the 1990 AAZPA Annual Conference in Indianapolis. A copy of the MOU can be obtained by writing to Michael Hutchins c/o the AAZPA Conservation Center, 7970-D Old Georgetown Road, Bethesda, MD 20814.

AAZPA Research Coordinator's Committee to Form

A Research Coordinator's Committee is forming under the auspices of the AAZPA Wildlife Conservation and Management Committee's Vice Chairman for Zoo Biology and Research and Director of Conservation and Science. The committee is open to all individuals responsible for coordinating the scientific efforts of AAZPA member institutions. The group is seen as fulfilling many important functions, including: (1) increasing the level of communication between scientists working within the AAZPA community, (2) fostering cooperation and understanding between zoo and university scientists and (3)

AAZPA...

promoting the growth of conservation science within the Association.

AAZPA Small Population Management Advisory Group Formed

An AAZPA Small Population Management Advisory Group has been formed. The goal of this effort is to create a cadre of individuals who can serve as consultants to SSP masterplanning sessions and to advise ISIS on the future development of species management software (e.g., SPARKS and ARKS). A special AAZPA-funded training session will be held at the National Zoological Park's Conservation and Research Center in Front Royal, VA from 1-6 April 1991. Twelve selected participants will undergo intensive training in genetic and demographic management and SSP masterplanning techniques. Jon Ballou, Tom Foose, Robert Lacy and Randy Rockwell will serve as instructors.

Masterplanning Session Held for Aruba Island Rattlesnake, Radiated Tortoise, and Dumeril's Ground Boa

A masterplanning session for the Aruba Island Rattlesnake (*Crotalus durissus unicolor*), Radiated Tortoise (*Geochelone radiata*) and Dumeril's Ground Boa (*Acrantophis dumerili*) was held at St. Catherine's Island, Georgia from 13-18 October 1990. More than 15 zoo specialists participated, including species coordinators Andrew Odum, John McLain and Bill Holmstrom, and AAZPA Conservation Biologist Dr. Robert Wiese. Genetic and demographic analyses were performed and a number of breeding recommendation formulated.

AAZPA Approves Taxon Advisory Groups

Four new North American regional taxon advisory groups (TAGs) have been approved by the AAZPA Wildlife Conservation and Management Committee (WCMC). TAGs will be responsible for regional strategic planning, including recommendations for new SSPs and studbooks. Those interested in receiving information should contact the following:

Amphibians: Robert Johnson, Metropolitan Toronto Zoo; Richard Sajdak, Milwaukee County Zoological Gardens or Frederick Paine, Buffalo Zoological Gardens

Antelope: William Zeigler, Miami Metrozoo.

Chelonians: Brett Sterns, Institute for Herpetological Research, Stanford, CA

Falconiformes: Ed Diebold, Milwaukee County Zoological Park

Invertebrates: Randy Morgan, Cincinnati Zoo and Botanical Garden

Taxon Advisory Groups to Form

Preliminary efforts are underway to establish several new AAZPA taxon advisory groups. Those interested in receiving information should contact the following:

Caprids: Larry Killmar, San Diego Wild Animal Park
Cervids: Jim Dolan, San Diego Zoo or Jim Doherty, New York Zoological Park

Chiropterans: Reg Hoyt, The Phoenix Zoo

Equids: Cheryl Asa, St. Louis Zoological Park

Girrafids: Fred LaRue, Dallas Zoological Park or Ann Petric, Chicago Zoological Park

Mustelids and Viverrids: Pat Foster-Turley, Marine World/Africa USA or John Carnio, Metropolitan Toronto Zoo

Old World Monkeys: David Ruhter, Houston Zoological Gardens, Wendy Turner, Chyenne Mountain zoo or Fred Koontz, New York Zoological Park

Tapirs: Rick Barongi, San Diego Zoo

Felids: Jill Mellen, Seattle or David Wildt, National Zoological Park

Brazilian Fauna Interest Group to Form

An AAZPA Brazilian Fauna Interest Group (FIG) is forming. The Brazilian Group will be the third such committee to develop under the auspices of AAZPA, which now has regional FIGs for both Madagascar and Indonesia/Malaysia. FIGs help to coordinate conservation and scientific efforts of AAZPA institutions working in a particular geographical region and to serve as a communications network for AAZPA members and member institutions.

Brazil contains a variety of animals that are of great interest to the AAZPA, including golden lion tamarins and various other New World monkeys, parrots, tapirs, giant anteaters, maned wolves, etc. Those wanting more information should contact Natasha Schischakim c/o Houston Zoological Gardens or John Wortman in c/o Denver Zoological Gardens.

Cuban Amazon Consortium/SSP to Form

The AAZPA will receive nearly 50 Cuban Amazon Parrots (*Amazona leucocephala*) confiscated by the US Fish and Wildlife Service in Florida. Ownership of the birds will be transferred to the AAZPA Clearinghouse Committee, chaired by Bill Fiore, which will ultimately be responsible for their dispersal. An advisory committee chaired by Ron Johnson, Miami Metrozoo has developed selection criteria for participating individuals and institutions and will be making recommendations for appropriate placement of the birds. One criterion for participation in the consortium will be the willingness to sign a memorandum of participation in an SSP. The birds are listed on Appendix I of CITES and an organized captive breeding program could contribute significantly to their conservation.

SSP Established for the Virgin Island Boa

A new SSP has been established for the Virgin Island Boa (*Epicrates monensis*). This small nocturnal and solitary boid is highly endangered. Clearing of forests for agriculture and introduction of feral mammals, such as the domestic cats and black rats, have decimated wild populations. Species coordinator

Dr. Peter Tolson, Conservation Biologist/Research Coordinator for the Toledo Zoological Park is a recognized expert on this species, having spent many years surveying its populations and collecting natural history data.

International Studbook Approved for the Great Hornbill

An international studbook has been approved for the Great Hornbill (*Buceros bicornis*). For information contact Studbook Keeper Wendy Worth c/o the Department of Ornithology, New York Zoological Park, 185th and Southern Blvd., Bronx, NY 10460.

AAAS Symposium on Advances in Zoo Biology

Dr. Ben Beck, Associate Director of Animal Programs at the National Zoological Park will be chairing a special symposium of the American Association for the Advancement of Science (AAAS) titled: "Advances in Zoo Biology and Conservation." The speakers and topics include:

Michael Hutchins, AAZPA: "Species survival plans: Cooperative efforts to save endangered species."

Beth Stevens, Zoo Atlanta: "Biologically salient features of zoo environments."

Richard Montali, National Zoological Park: "Causes of death of zoo-born giant pandas."

Nancy Czekala, San Diego Zoo: "Reproductive endocrinology of zoo and wild gorillas."

Mark Stanley-Price, African Wildlife Foundation: "Reintroducing zoo-born animals to the wild."

LouAnn Dietz, World Wildlife Fund: "Public education and professional training in wildlife conservation."

The symposium is scheduled for 18 February 1991 in Washington, D.C. Those wishing to attend should contact the AAAS, 1333 H Street NW, Washington, D.C. 20005.

Fort Wayne Children's Zoo Supports Primate Conservation

The Fort Wayne Children's Zoo has joined an effort by Dr. Richard Tenaza of the University of the Pacific to establish a reserve for four threatened species of indigenous primates on Indonesia's Mentawi Islands. Initial support by the zoo has included: (1) creation of a trilingual poster promoting primate conservation in the region, (2) purchase of uniforms for West Sumatran conservation officers, (3) sponsorship of Dr. Tenaza's travel to the Mentawi Islands and to conferences in Japan and Indonesia and (4) sponsorship of Dr. Linda Prasetyo's attendance at the 1990 AAZPA Annual Conference in Indianapolis and to collaborate with Dr. Tenaza on project planning. Dr. Prasetyo works for the Republic of Indonesia's Office of Forest Protection and Nature Conservation.

This report was submitted by Michael Hutchins, AAZPA Director of Conservation and Science, and Robert Wiese, Conservation Biologist.

Meetings...

Sharks Down Under Conference, 25 February-1 March 1991, Sydney, Australia. Contact: Sharks Down Under, Taronga Zoo, P. O. Box 20, Mosman, 2088, Sydney, Australia. Fax: 02 969 7515.

16th Annual Meeting of the Desert Tortoise Council, 8-11 March 1991, Las Vegas, Nevada. Contact: Dr. Kristin H. Berry, Symposium Chair, 7006 Westport St., Riverside, CA 92506, USA. Fax: 714 276-6343.

Biological Diversity of the Rocky Mountains, 12-15 March 1991, Fort Collins, Colorado. Contact: Biodiversity Symposium, Office of Conference Services, Colorado State University, Fort Collins, CO 80527, USA.

International Symposium on the Biology and Conservation of Rhinoceros, 9-11 May 1991, San Diego, California. Contact: Dr. Oliver Ryder, 1991 Rhino Conference, Zoological Society of San Diego, P. O. Box 551, San Diego, CA 92112-0551, USA.

International Conservation Workshop for the Bonobo, 6-7 May 1991, San Diego, California. Contact: Sharon Baker, Curators' Office, Zoological Society of San Diego, P.O. Box 551, San Diego, CA 92112-0551, USA. Fax: 619 231-0249.

Biology and Management of Fishers, 29 May - 1 June, 1991, Laramie, Wyoming. Contact: Dr. Steven W. Buskirk, P.O. Box 3166, University of Wyoming, Laramie, WY 82071, USA.

Biodiversity and Collections, 16-18 May 1991, College Station, Texas. Contact: Association of Systematics Collection, 730 11th St NW, 2nd Floor, Washington, DC 20001, USA.

Science and Management of Protected Areas, 14-19 May 1991, Wolfville, Nova Scotia. Contact: Neil Munro, Canadian Parks Service, Environment Canada, Halifax, Nova Scotia B3J 1S9, Canada.

The Pandas: A Conservation Initiative, 2-7 June 1991, Washington, D. C. USA. Contact: Devra G. Kleiman, Department of Zoological Research, National Zoological Park, Smithsonian Institution, Washington, D. C. 20008, USA. Fax: 612 673-4686

Wildlife 2001: Populations, 29-31 July 1991, Oakland, California, USA. Contact: Dale R. McCullough or Reginald H. Barrett, University of California, Department of Forestry and Resource Management, 145 Mulford Hall, Berkeley, CA 94720, USA. Fax: 415 643-5438.

Botanic Garden Conservation Activities, 1-5 September 1991, Kew, England. Contact: Ian Beyer, Kew Conservation Conference, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, United Kingdom.

Captive Breeding Specialist Group Annual Meeting, 27-29 September 1991, Singapore. Contact: CBSG, 12101 Johnny Cake Ridge Rd., Apple Valley, MN 55124 USA.

AAZPA/CBSG Dictionary of Acronyms

by Robert Weise and Michael Hutchins (AAZPA) and Judith Mikolai (CBSG)

The number of acronyms in common use by zoologists and conservationists has proliferated to the point where we felt it was time to compile a list for our readers. The list of acronyms that follows is not intended to be exhaustive. Readers are invited to send additional contributions to the authors.

- AAAS - American Association for the Advancement of Science
 AAM - American Association of Museums
 AAZPA - American Association of Zoological Parks and Aquariums
 AAZV - American Association of Zoo Veterinarians
 AERSG - African Elephant and Rhino Specialist Group
 APHIS - Animal and Plant Health Inspection Service
 ARAZPA - Australasian Regional Association of Zoological Parks and Aquariums
 ARKS - Animal Records Keeping System
 AZDANZ - Association of Zoo Directors of Australia and New Zealand
 BLM - Bureau of Land Management (USDI)
 CAP - Conservation Assessment Program
 CAZPA - Canadian Association of Zoological Parks and Aquariums
 CBSG - Captive Breeding Specialist Group (IUCN)
 CDC - Centers for Disease Control
 CEF - Conservation Endowment Fund (AAZPA)
 CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora
 COGBAZ - Council Of Governing Bodies of Australasian Zoos
 CPR - Captive Propagation Rescue
 CRC - Conservation Research Center (National Zoological Park at Front Royal)
 CRES - Center for Reproduction of Endangered Species (Zoological Society of San Diego)
 CREW - Center for Reproduction of Endangered Wildlife (Cincinnati Zoo)
 DICE - Durrell Institute of Conservation and Ecology
 DRG - Division of Research Grants (NIH)
 ECAZA - European Community of Zoological Parks and Aquariums
 EEC - European Economic Community
 EEP - Europaisches Erhaltungszucht Programme (European version of SSP)
 EIS - Environmental Impact Statement
 EPA - Environmental Protection Agency
 ESA - Ecological Society of America
 FAO - Food and Agriculture Organization (United Nations)
 FASEB - Federation of American Societies for Experimental Biology
 FIC - Founder Importance Coefficient
 GLT - Golden Lion Tamarin
 GMPWG - Global Management Plan Working Group
 GP - Giant Panda
 GSA - General Services Administration
 IBPGR - International Board for Plant Genetic Resources
 ICBP - International Council for Bird Preservation (IUCN)
 IGBR - International Geosphere and Biosphere Program
 IMAG - Invertebrate Management Advisory Group
 IMFPG - Indonesian/Malaysian Fauna Propagation Group
 IMS - Institute for Museum Services
 IPCC - International Panel on Climate Change
 IPPL - International Primate Protection League
 ISIS - International Species Information System
 IUCN - The World conservation Union
 IUDZG - International Union of Directors of Zoological Gardens
 IZY - International Zoo Yearbook
 JAZGA - Japanese Association of Zoological Gardens and Aquariums
 JWPT - Jersey Wildlife Preservation Trust
 MAP - Museum Assessment Program
 MEDARKS - Medical Animal Records Keeping System
 MFG - Madagascar Fauna Propagation Group
 MOP - Memorandum Of Participation (in the SSP program)
 MVP - Minimum Viable Population
 NEA - National Endowment for the Arts
 NEH - National Endowment for the Humanities
 NFRZG - National Foundation for Research in Zoological Gardens (Netherlands)
 NIC - National Institute for Conservation
 NIH - National Institutes of Health
 NMFS - National Marine Fisheries Service
 NOAA - National Oceanic and Atmospheric Administration
 NOAH - National On-line Animal Histories (European version of SPARKS)
 NPS - National Park Service (USDI)
 NSF - National Science Foundation
 OSI - Office of Scientific Integrity (NIH)
 PADU - Protected Areas Data Unit (World Conservation Monitoring Center)
 PFC - Population Founder Coefficient
 PRC - People's Republic of China
 PVA - Population Viability Analysis
 SAVE - Save African Endangered Wildlife Foundation
 SCOPE - Scientific Committee On Problems of the Environment
 SMCC - Species Management Coordinating Council (ARAZPA and COGBAZ)
 SMP - Species Management Programme (Australasian version of SSP)
 SPARKS - Single Population Analysis and Record Keeping System
 SSC - Species Survival commission (IUCN)
 SSP - Species Survival Plan (AAZPA)
 SSPSC - Species Survival Plan subcommittee (AAZPA WCMC; no longer exists)
 TAG - Taxon Advisory Group (AAZPA)
 TFAP - Tropical Forest Action Plan
 TRAFFIC - Trade Records Analysis of Flora and Fauna In Commerce
 UNEP - United Nations Environmental Programme
 UNESCO - United Nations Educational, Scientific and Cultural Organization
 USDA - United States Department of Agriculture
 USDI - United States Department of the Interior
 USFWS - United States Fish and Wildlife Service
 USGCRP - United States Global Change Research Program
 USGS - United States Geological Survey (USDI)
 USMAB - United States, The Man And the Biosphere Program
 WCI - Wildlife Conservation International (New York Zoological Society)
 WCMC - World Conservation Monitoring Centre (Great Britain; formerly IUCN Conservation Monitoring Centre)
 WCMC - Wildlife Conservation and Management Committee (AAZPA)
 WRI - World Resource Institute
 WWF - World Wildlife Fund (International or U.S.)

Reader Survey

The CBSG needs information from our readers in order to develop an effective communication network. If you are interested in receiving this newsletter and in helping with the goals of the CBSG, please take a few minutes and complete the below questionnaire. *Current CBSG members do not need to complete this form.*

Title: Prof. _____ Dr. _____ Mr. _____ Ms. _____ Other _____

Name: _____

Position: _____

Institution Name: _____

Address: _____

Telephone: (office) _____ Telefax: _____

My areas of interest and specialization are: _____

Are you interested in participating in the CBSG? Yes _____ No _____

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Thank you for your cooperation. Please remove this page and mail to:

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Planning to Attend the 1991 CBSG Meeting?



If you are planning to attend the 1991 annual meeting of the CBSG to be held in Singapore, we would like to know in order that appropriate meeting accommodations can be arranged. We would also like to know if you plan to attend the Hornbill Population Viability Analysis to be held just prior to the CBSG meeting. *Completion and return of this information does not commit you to attend either meeting.*

I am planning on attending the following meetings (please mark one or both meetings):

Annual CBSG Meeting (27-29 September 1991) _____

Hornbill Population Viability Analysis (24-26 September 1991) _____

NAME: _____

ADDRESS: _____

INSTITUTION: _____

TELEPHONE: _____

PLEASE COMPLETE AND RETURN TO: **CBSG**
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*Newsletter of the Captive Breeding Specialist Group
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International Union for the Conservation of Nature and Natural Resources*



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