CROCODILE SPECIALIST GROUP

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IUCN--The World Conservation Union
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COVER PHOTO: *Caiman crocodilus* at Finca el Oasis, Barinas, Venezuela. Leonore Bacz A. photo

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EDITORIALS

ACTION PLAN ACTION. In March 1992 the Crocodile Specialist Group published CROCODILES: AN ACTION PLAN FOR THEIR CONSERVATION, culminating several years work gathering and collating information on the status and conservation needs of crocodilian species worldwide. The ACTION PLAN, as well the process of preparing it, focussed the activities of the CSG on several crocodilian species that were judged to be the highest priority for conservation action and stimulated a flurry of activity on these species. As a result, a number of field inspections, surveys and assessments were conducted during 1991 and 1992 that have resulted in immediate advances in the conservation of crocodilians.

These activities were conducted by CSG members under the auspices of the CSG, in many cases in close collaboration with the Secretariat of CITES, and supported by a variety of governmental and private donors. Each of these field activities was followed within days by the production of a report making recommendations on which further conservation could be based. The very rapid production of the results of these surveys has greatly facilitated the prompt reaction of the CSG and other conservation bodies to immediate conservation issues. Each of these reports has been previously distributed to cooperating agencies, sponsors and the governments of countries involved and circulated within and outside the CSG. Nevertheless, it was thought advisable to give these reports a wider circulation in order that the important results and recommendations that they contain can receive the widest possible distribution and effectiveness. A generous donation from Mr. Ulai Youngprapakorn, of Samutprakan, Thailand, has made possible the production and distribution of the collected reports of CSG field activities in Cuba, Honduras, Thailand, Indonesia, China, Philippines, Vanuatu and Paraguay. This volume will be available in the New Year and will be distributed to members, CITES Management Authorities and other interested bodies.

The CROCODILE ACTION PLAN provided a background and focus for conservation of crocodiles, but conservation in the modern world is a rapidly advancing and constantly variable field. Our ACTION PLAN is a dynamic working document that will be constantly updated. Plans are already underway to have Action Plan Compiler, Dr. John Thorbjarnarson, prepare revisions.

The recent CSG field activities and reports constitute the immediate implementation of CSG ACTION PLAN recommendations. The ability to identify, assess and respond to problems in a prompt manner is of inestimable value in winning the race for the conservation of species and habitats. This collection of reports demonstrates the success that can be achieved by the effective coordination of government agencies, NGO's, donors, Crocodile Specialist Group experts and Management Authorities to respond rapidly and effectively to conservation needs. -- Professor H. Messel, Chairman CSG.

MEDICINAL USE OF CROCODILIANS, THREAT OR OPPORTUNITY? The receipt of a report from Olivier Behra in Madagascar on medicinal use of crocodile oil, published below, prompted me to recall several similar reports received recently from different parts of the world. Well known alligator expert Tommy Hines, recently recounted to me an observation made on the lower Rio Napo in Ecuador near the Peruvian Border, during his recent caiman surveys there. He came across an indigenous crocodile hunter who was capturing black caiman to extract the fat, which he planned to sell as a tonic for the lungs in Peru. Robert Godshalk, a graduate student studying caiman use in Venezuela and
Bolivia, recently reported medicinal use of crocodile fat and oil. Jose Ottenwalder reports that one possible motivation for the recent outbreak of poaching Crocodylus acutus in Lago Enriquillo, Dominican Republic, (NEWSLETTER 11(3) pg. 11 and 16) may be for the fat which is used a folk remedy for asthma. John Thorbjarnarson reports similar use in Haiti (1988. Bull. Florida State Mus. Biol. Sci. 33:1-86.). David Blake reports in the volume CONSERVATION AND UTILIZATION OF THE NILE CROCODILE IN SOUTH AFRICA (G.A. Smith and J. Marais editors, see page 13 for review) that the only significant poaching of crocodiles in South Africa is for use in traditional medicine.

A common theme runs through these reports. The active principle in all cases is said to be the fat or oil derived from the fat. Crocodile oil is most commonly applied to ailments of the respiratory system, cough, asthma, etc. and secondarily to connective tissue, skin and joint ailments. I am unable to determine whether the oil is taken internally or applied externally or both, but its efficacy is widely believed by numerous diverse rural cultures.

On first analysis this 'new' use of crocodiles might be viewed with dismay as yet another threat to these often endangered species. However, I think Olivier Behra is on the right track when he proposes below that medicinal use might be one more value to add to a crocodile that makes the incentive to conserve populations and habitats, outweigh the widespread tendency to eliminate them as useless vermin. In today's depressed market for skins the use of alternate products often makes the difference between economic success and failure for many crocodile producers and the addition of a new, potentially valuable, product should be welcome. It would be valuable to analyze the components of crocodile fat and oil to verify the pharmacologic activity. In this respect the report by Mark Ferguson and Ray Noble at the Zimbabwe CSG Meeting on the very different fatty acid proportions found in alligators compared to birds and mammals might be of significance. It has become routine, when justifying the preservation of biodiversity, to cite the likely existence of useful pharmaceutical products undiscovered in nature. While there are numerous examples from plants (Pyrethrum, quinine, the cancer cure from Madagascar periwinkle flowers, etc.) there are few from animals. How exciting if our crocodiles turn out to be the source of a valuable pharmaceutical. Alternatively it seems equally possible that crocodile fat contains useful amounts of some already well known vitamin, many of which are fatty acids. If ranched crocodile oil is an economic source of such a product for a vitamin hungry developing world it would be an equally useful supplement to the intrinsic value of crocodilians and an incentive for their conservation. — Perran Ross, Executive Officer, CSG, Florida Museum of Natural History, Gainesville, FL 32611, USA.

AREA REPORTS

AFRICA

Madagascar:

A NEW USE FOR CROCODILES IN MADAGASCAR. I have heard that the oil extracted from crocodile meat has a traditional use in Madagascar as a medicine, however, until recently this seemed restricted to rural populations who used it as a tonic and topically for treating open wounds. Now crocodile oil seems to be finding mainstream acceptance even in the capital, Antananarivo.

Knowing that I work on crocodiles, several people have asked me where they can get crocodile oil and one person insisted that this was the only effective treatment of asthma for his son. Investigating further we found that hospitals are now using and selling crocodile oil for the treatment of a variety of ailments including burns, skin ulcers that show allergic reactions to other medicines, cancer and melanomas. However, by far the most important use is for asthma, especially with antibiotics such as theophylline. At the Ravoahangy Andrianavalona hospital they use crocodile oil as a prescription for asthma and sell it on request for other purposes.

The hospital price of oil is the equivalent of US $10.00 per kilo, the street price is slightly higher. In the west of Madagascar where most of the wild crocodiles are found the price is US $3.00 per kilo. The average annual income in Madagascar is around US $210. The oil is
extracted by craftsmen who slowly cook the meat, or, as preferred by the pharmacologists, hang the meat from a trellis to drip.

Although Madagascar has crocodile ranching the oil is taken from wild animals. We have no information on the number of animals killed, but believe that the present uncontrolled trade could be managed to give further value to crocodilians through sustainable use. At the moment, however, the exploitation of crocodiles for their oil is simply adding pressure to wild populations.
-- Olivier Behra, CSG Deputy Vice Chairman, Lot VX 18, Andrifandrova, Antananarivo, Madagascar.

South Africa:

NEWS FROM MANYANE GAME LODGE. Following the very successful CSG Working Meeting in Zimbabwe, Johan Marais and colleagues hosted a number of visitors in South Africa including a delegation from Thailand, Val and Kathy Lance, and Paul and Dean Moler of USA. Visitors inspected the Manyane Farm, Kwenza Gardens Crocodile Farm and Jan Kuhlmann's very impressive farm that is a model for commercial farmers. After going on a game drive, visiting an ostrich farm and eating lots of fine South African seafood, the guests were treated to excellent Thai cuisine cooked up by our guests in the Manyane Lodge kitchen.

The South African crocodile farming industry is struggling ahead with less than 4,000 skins exported last year. Grading of skins has become very vigorous and in some cases as few as a third of export skins are top grade. More and more farmers are having their skins tanned locally and manufactured into products for local sale. Purses, wallets, handbags, belts and briefcases are being produced. Manyane Lodge is locally tanning all their skins and selling products in their restaurant. So far demand exceeds our supply. As there is no organized marketing of skins for export from South Africa, many farmers will have to resort to disposing of products locally. -- Johan Marais, Managing Director, Manyane Game Lodge and Crocodile Farm, P.O. Box 3, Buhrmannsdriif, 2867, Republic of South Africa.

Zambia:

SOUTH AFRICAN - ZAMBIA CROCODILE CENSUS. In January 1992 the Crocodilian Study group of Southern Africa was approached to join an expedition to the Southern Luangwa National Park in Zambia to conduct a crocodile census covering some 200 km of the Luangwa river. A reconnaissance flight over the census area revealed low water levels and many hippo throughout the park, raising concerns about boat operation safety. A further complication was the numerous, heavily overgrown oxbow lakes that held many crocodiles. The noxious water plants made boat survey of these areas impossible and few crocodiles were visible from the air.

We planned the survey to operate from four base camps, working from north to south, and using two teams to count simultaneously on different stretches of river. Teams consisted of a counter and an assistant to record data and would use two jet boats with a "rubber duck" (inflatable boat) as a backup. Each team was to cover some 30 km during the day collecting ecological information then return over the same stretch that night doing spotlight counts. Both teams would then relocate 60 km south along the river and repeat the exercise. Accurate locality data would be obtained with G.P.S. systems.

The expedition, consisting of 24 vehicles and more than 60 people, drove in convoy over 2,500 km to the Luangwa Valley but upon arrival realized that the water level was far too low to conduct an accurate census. With the water level dropping by the hour, the jet boats overheated, even the inflatables became stuck on sandbanks and the main channel was inundated with hippo. Within an hour of putting boats in the water it was decided to call off the census.

The organizer of the expedition tried desperately to keep the census alive and even suggested that we continue the census from the river bank using jeeps. We got the impression that some of the organizers had hoped that a favorable result from the census would enable them to obtain at very low or no cost, breeding crocodiles from the Zambian government to establish a commercial crocodile farm. It is of utmost importance that responsible scientists become involved in activities such as the attempted Luangwa census to ensure that meaningful data is collected and published and, in doing so, help ensure that dwindling natural resources are not unjustly depleted for commercial gain. -- Johan Marais, Managing Director, Manyane Game Lodge and Crocodile Farm, P.O. Box 3, Buhrmannsdriif, 2867, Republic of South Africa.
EASTERN ASIA & OCEANIA

China:

DEVELOPMENTS IN ALLIGATOR FARMING IN CHINA. Since 1988 the Anhui Research Center of Chinese Alligator Reproduction (ARCCAR) has been producing second generation (F2) Chinese alligators. Stimulated by this success there has been widespread interest in breeding alligators. In 1990 a new farm was built in Baiyang Lake, Zhuhai, Guangdong Province. This farm is raising 70 Chinese alligators and a few Crocodylus porosus. In 1991 the C. porosus produced a brood of 35 eggs but only a few hatched. In 1992 another clutch of 45 eggs was laid by C. porosus, but the Chinese alligators have not yet bred, apparently because they are not yet mature.

In 1991 another breeding farm was built in Da-zhi-po, Qionghshan in Hainan Province. This farm is raising 50 Chinese alligators that are now growing normally. In July of 1992 a new breeding farm was opened on Chongming Island, Shanghai, which is raising 200 alligators. This island has very alkaline soil and the water pH is 7.4 - 8.4 and the salinity is 1200-1300. The alligators have not yet shown any adverse effects of these conditions after 3 months. All the stock to establish these three new farms were obtained from ARCCAR, the great majority of them F1 but a few F2 animals. The survival of the animals in these new farms indicates a good adaptation of Alligator sinensis to these captive conditions and survival and breeding is expected within the next 3-5 years. -- Zhang Zhengdong, Anhui Research Center of Chinese Alligator Reproduction, Xuanjchen, Anhui, Peoples Republic of China.

WESTERN ASIA

India:

CROCODILE NEWS FROM ORISSA. The Nandakan Zoological Park maintains one male a six female gharials in their breeding enclosure. In March 1992, five of the females laid a total of 207 eggs (average clutch 41.4 eggs), and 155 hatchlings were produced. Eggs were incubated both in an incubator and in the natural nests in the enclosure with an overall hatch success of 75%, and hatching occurred between 25 May and 12 June. One female mugger (C. palusstris) also produced eggs this year but the breeding program for C. porosus has been impeded by the death of the captive female. There is a proposal to bring two female porosus from Bhitarankia Crocodile Research center to re-initiate the porosus breeding program.

In the Bhitarankia Wildlife Sanctuary 20 nests of C. porosus were located during May 1992, but only four clutches of eggs were collected. These four clutches totalled 224 eggs and produced 170 hatchlings after 75 to 78 days incubation. At present the Research center is raising more than 600 C. porosus ranging from this year’s hatchlings to 18 years old individuals. As has been reported earlier, the release and release program has been greatly slowed due to the conflicts with people in the area which has restricted the number of new releases. To date,
1,200 captive reared crocodiles have been released into the river systems of the Bhitarkanika Wildlife Sanctuary. -- Sudhakar Kar, Research Officer, Wildlife, Wildlife Wing, Forest Department, Orissa, India.

IUCN/SSC INDIAN SUBCONTINENT REPTILE AND AMPHIBIAN GROUP (ISCRAG), held its first meeting in Orissa in February 1992 and a regional meeting of CSG members was convened consisting of M. Rahman (Bangladesh), Binod Choudhury, D. Basu, S. Kar, Chandrasekar Kar, R.J. Rao, Harry Andrews and chaired by Romulus Whitaker. Discussions were held of the Indian crocodilian captive breeding and release program, which seems to be grinding to a halt. Members from various regions reported that all crocodile breeding and release programs have been scaled down, including the Uttar Pradesh gharial project and the saltwater, mugger and gharial program in Orissa. Animals slated for release (mainly saltes and gharials) are being held in captivity, in some cases for as much as two years, due to lack of areas to release them. In many facilities the eggs from captive breeding programmes are being destroyed or allowed to rot. The main problems are cost of feed and space to maintain the animals.

In view of the fact that the mugger (C. palustris) is no longer endangered, the meeting proposed that it should be shifted to Appendix II of CITES. A statewide survey is planned and action plans will be formulated on the basis of these surveys. Binod Choudhury reported he will conduct surveys in various states and D. Basu has recently completed a 3 month survey of gharial in Uttar Pradesh. A detailed report on "CROCODILIANS CONSERVATION ON THE INDIAN SUBCONTINENT" has been prepared by Rom Whitaker and submitted for the Proceedings of ISCRAG.

Another difficult topic is the status of the Bhitarkanika Sanctuary in Orissa. This 140 sq km mangrove area is under pressure from encroachment, development and conversion of mangroves for a World Bank funded prawn culture project. Besides having the largest population of saltwater crocodiles in India this alteration of habitats is affecting the nesting beaches of half a million olive ridleys. The meeting recommended that the area be protected as a national park and that the adjacent 100 sq km of mangroves in the Mahanadi delta, known as the Kujang forest, also be included. The issue has been forwarded to the Marine Turtle Specialist Group for joint followup.

In another problem area, members of the CSG in India are extremely concerned about water levels in Hiran Lake, Gir National Park, which has the highest mugger concentration in India. For several years the water has been distributed for irrigation and water levels are dangerously low, resulting in loss of fish. 1991 survey counts resulted in 11 mugger sighted as against 180 spotted in 1990.

In Bangladesh it was reported that mugger survive in only one tank (reservoir) where only two breeding pairs are known. The gharial population of Bangladesh has been transferred to Indian jurisdiction when the 1991 monsoon floods shifted the Padma River across the border into India.

Following these valuable discussions it was agreed to hold similar meetings every year. -- Harry Andrews, Madras Crocodile Bank, Post Bag No. 4, Mamallapuram 603 104 T.N., India.

MADRAS CROC BANK. Crocodile breeding started late at the end of February 1992 but the muggers produced more than 2,500 eggs. Salt water crocodile, Siamese, Nile and Morelet's crocodile also bred this year making a total of seven species successfully breeding at the Croc Bank. The Crocodile Bank is conducting a survey of mugger in Tamil Nadu State, coordinated by Harry Andrews and conducted by researcher Ms. Smita Satheesh, funded by Dr. Jeffrey Lang. In early May this group visited some pristine mugger habitat to evaluate wild population numbers, assess the effects of restocking programs, compare pristine with artificial habitats, prepare an accurate count of mugger held in various captive breeding centers and identify areas for future re-stocking and long term mugger studies. From this information an Action Plan and management options will be formulated. As a result of this survey a five year study of the mugger in natural and altered habitats will be initiated in August 1992. Harry Andrews, Jeff Lang and research assistants Ms. Sateesh and R. Arumugam have already identified two sites for intensive studies. Continuous survey and monitoring of mugger populations throughout the State are planned and a field station will be set up at one study.
area. Plans are also underway for mugger surveys in other States and a *C. porosus* survey in the Andaman and Nicobar islands which will help formulate a long term study and management plan for these species in this region. -- Harry Andrews, Madras Crocodile Bank, Post bag No. 4, Mamallapuram 603 104 T.N., India.

CENTRAL & SOUTH AMERICA

Belize:

MORELET’S CROCODILE STUDIES. During the summer of 1992 I conducted field work in Belize on the nesting ecology and food habits of *Crocodylus moreletii*. The initial study area was Cox Lagoon, the site of a recently proposed national park. Cox Lagoon supports a large population of Morelet's crocodile and typically 40-50 individuals were observed in the three hours required to survey the lagoon. Unfortunately, this population is subject to illegal hunting and adult crocodiles proved wary and difficult to approach. A single nest was located in mid June but was lost to rising water levels shortly after.

An alternative study site was developed on a large private ranch in the Orange Walk district. The landowner has expressed a keen interest in crocodile conservation and the population is fully protected. Crocodiles are abundant here and easy to observe. I found crocodiles in every wetland area I investigated on the ranch including creeks, ditches and stock ponds and ten nests were located.

I was also able to survey other areas in central and northern Belize. Spotlight counts in mangrove swamps surrounding Belize City revealed low densities of adult crocodiles. Marshes adjacent to the Northern Highway, known as ‘reed ponds’ usually contained two or three adult crocodiles and evidence of nesting found at one location. Landowners I talked to seemed to tolerate these crocodiles and made no effort to remove them.

Morelet’s crocodile is fully protected in Belize, but some illegal killing does occur. Overall the illegal killing seems small and I found no evidence of large scale poaching. I was told of several crocodiles being shot and skinned and a member of the British Forces Belize reported finding a skinned carcass in Mussel Creek. One person told me that skins could be sold in Mexico. A landowner reported that two crocodiles were killed by poachers on his property and the tails sold to restaurants in Belize City that cater to tourists. Others told me of shooting large crocodiles near swimming areas for safety reasons. I was also told of two cases of man-eating by large crocodiles, but I was unable to investigate these reports. Some crocodiles are occasionally caught and drowned in turtle and fish nets. -- Steven Platt, Department of Biological Sciences, Clemson University, Clemson, SC 29634-1993, USA.

Costa Rica:

CROCODILE POPULATION IN RIO GRANDE DE TARCOLES. Spatial distribution and population size of *Crocodylus acutus* were estimated during the dry season (January-April) of 1989 and 1990 in the Grande de Tarcoles river, SO Costa Rica. A high density (19.1 individuals /km) was found with no difference between years. The size class distribution was 43.9% juvenile, 21.3% sub-adult and 34.8% adult. Similar results have been reported in other parts if its range. [abstract of a paper in Spanish - Sasa, M. and G. Chaves 1992. Tamaño, estructura y distribucion de una poblacion de *Crocodylus acutus* (Crocodilea, Crocoididae) en Costa Rica. Rev. Biol. Trop. 40(1):131-134.] -- Mahmood Sasa, Inst. Clodomiro Picado, Facultad de Microbiologia, Universidad de Costa Rica, San Jose, Costa Rica.

Ecuador:

BLACK CAIMAN IN ZANCUDO COCHA. The black caiman, *Melanosuchus niger*, has been virtually eliminated from its range of a century ago. *M. niger* is thought to exist only in a few isolated lakes and streams of the Amazon basin, yet poaching still takes place due to lack of enforcement in remote areas. The overall abundance of this species is estimated to have declined to less than 1% of its original level. Herron (1991, Biological Conservation, 5:103-113) noted that black caiman face a greater difficulty than other species in recruiting breeders into a population due to the length of time they are vulnerable for poaching.

In January 1990 I took part in an expedition to Zancudo Cocha, Ecuador (0° 23’ S, 75°31’W,
215 m elev.) to estimate the population of black caiman and monitor site tenacity using radio tracking. The lake is 3.4 km by 2.3 km with 11.4 km of shoreline and at very high water levels drains into Aguarico river 6 km distant.

Nightly shoreline surveys were conducted by canoe for ten nights and animals captured by snare pole and by hand. Population estimates were obtained using Lincoln-Peterson and Schnabel mark and recapture techniques. A total of 63 black caiman were captured giving an estimated population of approximately 150 individuals. The estimate is probably low as very large animals and hatchlings were under represented in the sample. Size and sex data were reported for 38 animals in the sample. Total length varied from 52.3 cm to 184.0 cm. Twenty one females and 17 males were recorded.

If the species is to persist, a long term monitoring project is needed as well a strict protection from poaching. Determination of the effective population size to maintain genetic diversity is crucial for the long term sustainability of such isolated populations. An approach utilizing matrix modelling, based on parameters collected by repetitive sampling of the population, and analysis of genetic diversity using tissue samples is recommended and discussed. -- Extracted from a report RECOMMENDATIONS FOR THE USE OF MATRIX MODELLING IN A POPULATION OF BLACK CAIMAN, 1992, by Scott A. Bowes, F.O. Box 1274, Manomet, MA 02345, USA.

Uruguay:

EXPERIMENTAL FARMING OF BROAD-SNOUTED CAIMAN, Caiman latirostris. Culture of the broad snouted caiman is being conducted in the Fish Culture Center at Villa Constitucion (Department of Salto). This Center is a dependency of the Instituto Nacional de Pesca (INAPE=National Fisheries Institute), which in turn is part of the Ministerio de Ganaderia, Agricultura y Pesca (Ministry of Livestock, Agriculture and Fisheries). The research project is financed by INAPE with the contribution of the International Foundation for Science. Lic. Carlos Rios Parodi is in charge of the project.

The area was chosen for three important reasons: 1. Because it is an important center of the wild caiman population; 2. Because INAPE has a fully equipped Fish Culture Center there and; 3. Because it is the area with the highest average and maximum temperature in the country.

At present there are over 100 specimens being maintained, most of them being juveniles and sub-adults no more than 3 years old. These individuals were born in captivity or captured from the wild, either as juveniles, or in a few cases, as adults.

The study includes the study of nests; capture and tagging of juveniles, sub-adults, and adults; sampling; study nests and hatching; behavior; food and feeding in nature. The culture of the species includes feeding and adaptive responses to captivity; growth and food conversion; breeding techniques; induced maturity techniques and artificial hatching; optimal age for commercial harvest and study of diseases and their treatment.

The program has been operational since 1989. One of the biggest problems to solve was the creation of a natural environment for adults under captivity. Today they are installed in fenced areas approximately 2,000 m². The fence, constructed in 1991, consists of a net wire fixed to concrete girders. At the beginning of 1992 five adults escaped having bitten through the wire or separated it from the concrete. No solution has been found to this problem yet but we announce this so that other researchers may take it into account. -- Federico Achaval, Departamento de Zoologia Vertebrado, Instituto de Biología, Facultad de Ciencias, Tristan Narvaja 1674, Casilla Correos 10.773, 11.200 Montevideo, Uruguay.
Venezuela:

THERMAL CONDITIONS FOR BABAS. *Caiman crocodilus* is one of the smallest crocodilian species. The species extends from Mexico to Brazil. Recently important projects have been presented for establishing programs for the breeding of these animals under captive and semi-captive conditions. Young crocodilians are delicate and it is essential to have a good knowledge of their requirements for successful growth and breeding. Crocodiles frequently bask in the sun and the amount and temperature of water, distance to water, shade available and time of day play an important role in determining the amount of time they remain in the sun and their ability to maintain physiologically healthy temperatures. At chronically low body temperatures crocodiles cannot synthesize proteins effectively and this may result in gout, with paralysis of the limbs, lengthening and distension of the limbs. Urate accumulation occurring in the kidneys and joints leads to locomotion difficulties, malfunction and death eventually occurs. Considering these effects it is essential to know the tank water thermal fluctuations for maintaining and breeding babas in captivity. We therefore investigated the temperature in six 6 m X 2 m rectangular tanks that are used for raising babas in captivity in Barinas State, Venezuela, during months of February to May. Temperatures were monitored between 6 am and 9 pm daily with a Brannan thermometer (0°C-400°C). Daily temperature fluctuations of 8°C to 9.8°C were observed with minimum temperatures of 24-28°C and maximum temperatures of 32-34°C. These minimum temperatures are lower than the optimum temperatures (approx. 30°C) for optimal metabolism of babas. We therefore recommend supplying tanks with water heated to constant 30°C to optimize baba growth in Barinas State, Venezuela. -- Gregorio Avendaño, Leonor Baez & Leonardo Michelangeli, *Calle 5 con Calle 10, La Urbina, Edif. Centro Empresarial Orinoco, Piso 3, Of. 21, Caracas, Venezuela.

UN PLAN DE ACCION PARA SALVAR AL CAIMAN (*CROCODILUS INTERMEDIUS*). El taller para la supervivencia del Caimán del Orinoco, organizado por la Fundación para la Defensa de la Naturaleza (FUDENA), los días 22 y 23 de julio en Caracas, Venezuela, complemento el Plan de Acción elaborado por el Grupo de Especialistas en Crocódilidos de este país, para el manejo de esta importante especie.

El plan en cuestión se propone como metas la protección del hábitat natural de la especie, incluyendo el uso de tierras de propiedad pública y privada; determinar el estado poblacional de la especie a través de la evaluación de los factores tanto socio-económicos como ecológicos que influyen sobre conservación del Caimán del Orinoco y la
ampliación de proyectos de investigación relacionado con la criá en cautivero así como en las áreas donde se han reintroducido ejemplares.

Las conclusiones y recomendaciones recogidas en ese evento fueron reunidas en quatro bloques: Criá en cautivero; Vida silvestre; Liberación y Seguimiento y; Educación Ambiental y Guardería.

Las conclusiones y observaciones fueron incorporadas al Plan Acción, enriqueciendo su contenido y recogiendo el consenso expresado por los profesionales y organizaciones que actualmente trabajan para la Conservación de esta especie Venezolana en peligro de extinción. -- de ALERTA, Publicación Internacional Cuatrimestral de TRAFFIC (Sud America), Vol. 3 No. 1, Agosto 1992.

The Meeting for the Survival of the Orinoco Crocodile, organized by the Foundation for the Defense of Nature (FUDENA) on 22 and 23 July in Caracas, Venezuela, complements the ACTION PLAN FOR CROCODILES elaborated by the group of crocodile specialists in this country, for the management of this important species.

The plan in question proposes the protection of the natural habitat of the species, including public and private land use; the determination of the status of the species, including the evaluation of socio-economic and ecological factors which have an influence on conservation of C. intermedius and the expansion of research projects relating to captive breeding as well as in the areas where restocking has been undertaken.

The conclusions and recommendations recognized at this event were presented under four headings: Captive Breeding; Wildlife Ecology, Release and Followup and; Environmental Education and Enforcement.

The conclusions and observations will be incorporated in an Action Plan of richer content and recognizing the consensus expressed by the professionals and organizations who are actually working for the conservation of this Venezuelan endangered species. -- Free translation of the preceding article.

NORTH AMERICA

United States:

GOING, GOING, GONE. Officials of the US Fish and Wildlife Service destroyed most of 10,000 Caiman yacare flanks that were seized as illegal imports in 1988. At the time of seizure 8,100 of the flanks were in wet crusted condition,
approximately half vegetable crust and half chrome crust. All the wet items were stored for the duration of the case in sealed containers in a brine solution prepared by Mr. David Haire of American Tanning and Leather in Griffin, Georgia, USA.

After over four years in storage most of the flanks were still in good condition, particularly the chrome crusted skins. Some of the crusts did show a brown discoloration on the flesh side. A small number of specimens were retained for educational and scientific use and the remainder were buried in a landfill. -- Patrick E. McIntosh, Special Agent USFWS, Division of Law Enforcement, Savannah, Georgia 31412, USA.

GROWTH RATES OF ALLIGATORS IN LOUISIANA. A comparative study of the American alligator (Alligator mississippiensis) growth rates was made in estuarine and palustrine wetlands in southwestern Louisiana. In the estuarine wetlands, where characteristic salinity levels were \( \leq 50/00 \), alligators grew faster and therefore reached sexual maturity earlier than did those in palustrine wetlands, which are characterized by shallow, freshwater marsh vegetation. Slower growth rates in palustrine wetlands appeared to be related to prey density, indicated by previous studies to be lower than in estuarine wetlands. Males grew faster than females and therefore reached sexual maturity at an earlier age in both habitats. This study revealed a major limitation in using total lengths as an index upon which population age structure can be based even when alligators are in the same geographic region. -- Reprinted from William R. Rootes, Robert H. Chabreck, Vernon Wright, Bobby Brown and Thomas Jess. 1991. Growth rates of American alligators in estuarine and palustrine wetlands in Louisiana. Estuaries Vol 14, No. 4 : 489-494 -- R. Chabreck, Louisiana State University Agricultural Center, Baton Rouge, Louisiana 70803, USA.

GATOR THIRD IN FLORIDA AQUACULTURE VALUE. Farm raised alligator sales totaled $4.4 million for 42 farmers in 1991, this despite plummeting values of hides and slow sales, reported the Florida Bureau of Seafood and Aquaculture. Alligator ranks third in aquacultural value in the state behind tropical fish ($32.8 million) and aquatic plants ($10 million) and well ahead of oysters, clams and catfish. The Bureau, formerly called Bureau of Seafood Marketing, was recently transferred to the Florida Department of Agriculture and Consumer Services with the mission of enhancing marketing of products and further ensuring product quality. The Department’s efforts to support aquaculture, which includes alligator farms, are directed toward producer assistance and product development and promotion. Under its new organization it will combine services to both aquaculture and wild caught seafood products.

In the June Bulletin on Florida Aquaculture the Bureau presents figures indicating 1991 sales of $3,569,000 for Florida gator hides and $824,000 for meat from farms. The bulletin also reports losses of alligators in farms due to ‘predation’ of 12.9% of all losses. Disease is reported to cause 9.3% of losses and other unspecified causes including adverse weather, 77.8% of losses. [Mortality of Florida alligator farms is not reported. Surviving Florida Alligator farmers look forward to enhanced service from the Bureau in its new form. -- eds.]

- Meredith Rogers, Marketing Specialist, Bureau of Seafood and Aquaculture, 2051 East Drac Drive, Tallahassee, Fl 32310, USA.

ALLIGATOR PREDATION ON NESTLING EGRETS. Louis Hays-Odum found the following article which may be the first written description of this behavior.

‘Elm Lake in Brazos Bend State Park, is a shallow lake covered in aquatic vegetation where thousands of Cattle Egrets nest. In July Margaret Jones of the Houston Outdoor Nature Club, Ornithology Group reported detailed observations of a large alligator preying on nestlings in the following manner. The alligator moved slowly around a small area beneath the nests looking up. He then slowly lifted his head higher and higher until head and neck were out of the water almost to the front legs, at least five feet. He seemed to push against some of the willow trunks. Then from this uplifted position made a lightening lunge that brought down part of the bush, a nest and three fledglings. Engulfing the nest and two nestlings he backed off and lunged again to knock the remaining hatching into the water. After ejecting twigs and nest from his mouth the gator chewed [repositioned --eds.] and swallowed the two birds then backed out and approached the remaining
bird in the water from a more accessible direction. This bird was also seized and swallowed. Ms. Jones comments on the very slow and deliberate pace of this predatory activity and that a second alligator was later observed in similar behavior.” -- Adapted from THE SPOONBILL, Ornithology Group, Outdoor Nature Club, Houston, Texas, Vol XXXVII No. 6: 2.

GATOR PROOF? In a recent edition of World Fence News a short article and photographs from the suburbs of Savannah, Georgia, USA, shows a medium sized alligator, estimated total length about 2.5 m, easily scaling a 4 foot chainlink fence. The fence is a standard diamond mesh chain link fence supported on galvanized pipe supports and with a 2” pipe along the top. The fence did not have any overhang. The magazine, which caters to professional fencing and security people, comments that alligators might be a useful backup to suburban home security systems, but croc farmers and others interested in keeping crocodylians in, not keeping them out, should take note. -- WORLD FENCE NEWS, August 1992:5. Submitted by Louis Hays-Odum, c/o Andy Odum, Toledo Zoo, 2700 Broadway, Toledo, OH 43609, USA.

ALLIGATOR FOOD EXPO. Attendees at the Southeastern Food Service Expo, in Orlando, Florida, during September enjoyed alligator spread, snacks and other gator products at Alligator Bob's, one of 1,100 displays at the event. Despite the economic recession attendance was high and restaurant owners and managers roamed the booths looking for new food products, services and equipment. It was another opportunity to introduce people to the versatile pleasures of farmed alligator meat said Bob and Ellen Young. -- THE ORLANDO SENTINEL, 19 September 1992.

FLORIDA BLACK CAIMAN. In 1991 Florida alligator farmer Ron Nelson found three black caiman (Melanosuchus niger) in a quarry pit near Miami while searching for a larger black caiman rumored to be at large there. At the time there were no local or State regulations to cover this contingency and Ron was allowed to legally keep them. The State has subsequently amended the regulations to restrict such fortuitous finds in future. Following Ron Nelson's untimely death in June, his family and business partner agreed to place these valuable specimens with St. Augustine Alligator Farm to augment the breeding group of black caiman there. The three specimens, all about four feet in length, are currently undergoing quarantine and appear healthy. Mark Wise speculates that these animals were part of shipment of live black caiman seized by the US Fish and Wildlife Service and sent to San Diego. He will be contacting Lew 'Dracula' Densmore to extract blood samples for genetic analysis and the animals will join two similar size specimens from the San Diego group at St. Augustine to form a breeding group. -- Mark Wise, St. Augustine Alligator Farm, P.O. Drawer 9005, St. Augustine, FL 32085, USA.

ZOOS

OLDEST ALLIGATOR DIES. The South African National Aquarium and Reptile Park suffered a tragic loss with death of its American alligator. The animal had been housed at the zoo since 16 November 1920 and it was certainly one of the oldest alligators in any zoo. -- From Annual Report of the National Zoological Gardens of South Africa 1990-91. Submitted by Rene Honegger, Zoo Zurich, CH-8044, Zurich, Switzerland.

NEWS FROM AAZPA. The Crocodile Advisory Group of the American Association of Zoological Parks and Aquariums met in St. Louis, Missouri, USA, in June. The Group reviewed its progress in attaining goals and reported on the production of Studbooks (7 to date with three pending). The black caiman, Melanosuchus niger, was identified as a species of special concern citing its declining and drastically depleted numbers in the wild and difficulties of maintaining the species in captivity. Colette Hairston, Peter Brazaitis and Mark Wise will form a committee to coordinate action, including collaboration with South American zoos and the coordination of US breeding efforts.
A legislative alert concerning the proposed downlisting by the US Fish and Wildlife Service of the Yacare caiman from the US Endangered Species list was presented and the potential adverse effect on other endangered species was discussed.

The meeting defined short term goals for the coming year and welcomed new members: George Amato of New York Zoological Society, Colette Hairston of Gladys Porter Zoo, Brownsville, Texas, and Kevin Bowler of Audubon Park Zoo, New Orleans, La. -- From Minutes of the Crocodilian Advisory Group, AAZPA, John L. Behler, Coordinator, New York Zoological Park, Bronx, NY 10460 USA.

PHILIPPINE CROC BIRTHS AT GLADYS PORTER ZOO. On 26 August 1992, 11 Philippine crocodiles (Crocodylus mindorensis) were hatched at Gladys Porter Zoo in Brownsville, Texas, USA. They had been incubated at 30°C for 84 days prior to emergence. This brings the resident population of C. mindorensis at Gladys Porter Zoo to 3.1.20. Pending receipt of CITES permits, 5 juvenile C. mindorensis hatched in 1989 will be exported to Silliman University Crocodile Breeding Farm, Dumaguete City, Philippines. The design of this cooperative conservation project is to return US headstarted captive progeny to Silliman on an annual basis and exchange adult breeding animals to maintain genetic diversity in the captive population. -- Colette S. Hairston, Curator of Herpetology, Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520, USA.

NIKSON GRIFFIS GRANTS. Howard Hunt, Zoo Atlanta, and Jim Tamara, New York Zoological Society Survival Center, St. Catherines Island, Georgia, were recently awarded a grant from the Nixon Griffis Fund for Zoological Research for 'A Feasibility Study to Assess Cox Lagoon, Belize, Central America, as a Morelet's Crocodile Preserve'. The Nixon Griffis Fund for Zoological Research grants are available to members of the zoo and aquarium community. Grants, not to exceed $3,000 US are awarded semi-annually. Closing periods are 1 January and 1 July. For information about the fund and grant application procedures contact: -- John Behler, New York Zoological Society, New York Zoological Park, Bronx, NY 10460, USA.

PUBLICATIONS

CONSERVATION AND UTILIZATION OF THE NILE CROCODILE IN SOUTH AFRICA - HANDBOOK ON CROCODILE FARMING. Edited by G.A. Smith and J. Marais 1992. This publication is the product of a symposium held in Pretoria, South Africa, in June 1991, and additional submitted papers. It is by far the most comprehensive book on the subject produced in the region, with close to 200 pages of valuable text, well presented tables and figures and over 150 handsome illustrations and photographs. Topics covered include: International trade and CITES listing (Dr. P.F.S. Mulder, Dr. R. Luxmoore); Conservation status of the Nile crocodile in South Africa (D. Blake and N. Jacobsen); Status of Crocodile farming (J. Marais and G.A. Smith); operational and financial factors for farms and tourist facilities (Q.R. Coetsee, L.M. Brummer); facilities, husbandry and veterinary care (G.A. Smith, J.G. Kuhiman, J. Marais, R.A. Coulson, C.M. Foggin and M. Verstept); aspects of commercial skin preparation marketing and trade (J. Marais, G.A. Smith, K. van Jaarsveldt) and finally an exhaustive update on crocodile literature compiled by Tony Pooley. The material is well presented for both lay reader and scientists and includes some the most useful and up to date information concerning the Nile crocodile. A limited number of copies are available from the Crocodilian Study Group of Southern Africa at US $30.00 per copy with an additional $3.00 surface mail or $6.00 air mail per copy. Orders, accompanied by a bank draft or international money order should be mailed to -- The Crocodilian Study Group of Southern Africa, Department of Animal Science, Faculty of Agriculture, University of Pretoria, Pretoria 0002, Republic of South Africa.

DIRECTORY OF CROCODILIAN FARMING OPERATIONS. Richard A. Luxmoore, 1992. Second edition, IUCN, Gland, Switzerland and Cambridge, UK 350 pp. This long awaited volume updates the world list of facilities raising crocodilians but also provides a rich bounty of additional information for the crocodilian
connoisseur and researcher. The Directory is in two main parts, an INTRODUCTION TO THE FARMING OF CROCODILIANS edited by J.M. Hutton and G.J.W. Webb, and the DIRECTORY proper. The Hutton-Webb INTRODUCTION is one of the most up to date and succinct summaries of the basic do's and don'ts of crocodilian captive husbandry and lays out in simple terms, the basic considerations, and existing solutions, to most problems faced by prospective farmers and ranchers. It is the ideal introduction to both the concepts and literature of the subject and will become a best seller in its topic. A Spanish translation of this section is also available from the CSG office.

The body of the Directory lists facilities by country and provides basic information such as the contact address, size and type of facility, number and species of stock held and products exported. This information is summarized in tabular form at the beginning of the section for a ready reference on which the statistical and demographic structure of crocodilian farming can now be analyzed. This is followed by a very useful discussion of the history and present trends of the crocodile skin trade with a valuable and thoughtful analysis of the conservation value and some conservation concerns of crocodilian farming and ranching. Richard Luxmoore is to be congratulated on his job of this daunting compilation.

The editors have done an outstanding job of bringing together both useful information and thoughtful analysis. While all three editors provide sensible caveats about some inadequacies of the information provided to them it is evident that this volume is the definitive description of crocodilian farming.

Copies are available at a special price for CSG members of £10. Order from IUCN Publications Services Unit, 181a Huntingdon Road, Cambridge, CB3 0DZ UK -- Review by James Perran Ross, Executive Officer, CSG, Florida Museum of Natural History, Gainesville, FL 32611, USA.

17 November 1992
Dear Professor Messel,

Thank you for forwarding your excellent publication "CROCODILE SPECIALIST GROUP NEWSLETTER" to FAO. Its quality and information are always very useful for our knowledge on the crocodilian family.

However I think that FAO source should be cited whenever you use the results transmitted by FAO experts, such as Mr. Behra in Madagascar or Mr. Cox in Indonesia (Irian Jaya), who both got their information through their work in FAO projects. After all, you cite nominately projects implemented by IUCN, CITES or CMAT, and I think FAO should be recognized as a contributing agency in your laudable efforts to distribute information on crocodilian conservation and management round the world.

Mr. Jack Cox's final report on the FAO project "Development of crocodile industry on a sustained yield basis" will soon be published, and I shall send you a copy for your information. Mr. Cox got excellent results in Irian Jaya, and his
dedication to the project is to be noted. We still hope to identify funding to
develop the second phase.

You may not be aware that Mr.
Child retired recently from FAO and that
his successor should be nominated early
next year. You will be kept informed as
soon as the selection has been done.

Sincerely yours,
Serge J. Darroze, — Consultant, Wildlife and
Protected Areas Management, Forestry.
Department, FAO, Viale delle Terme di Caracalla,
Rome, Italy.

27 November 1992
Dear Dr. Darroze:

Thank you kindly for your letter of
17 November 1992 in relation to the CSG
Newsletter. I am most pleased that
this publication proves to be useful to you.

May I apologize immediately for any
oversight whatever by CSG to give full and
proper credit for any work carried out
through an FAO project. Having been in
the scientific field for over 50 years and
now heading up one of Australia’s private
universities, I take your point to heart. I
endeavor to encourage scientists, in
whatever field they are in, to be certain to
give due and proper credit to any
supporting organization. Certainly FAO
has done so much to support so many
important projects and deserves much
credit.

I am copying this fax to my Executive
Officer, Dr. Perran Ross, in Gainesville
and I am also asking him to publish your
full letter to me and my response in the
next issue of the Newsletter.

I am also faxing to you a copy of the
CSG Review Committee Report on
Crocodile Management in Indonesia.
May I draw your attention to pages 13 and
14 in relation to the projected FAO
Crocodile Project Stage II there. Though
during Stage I some excellent work was
done, and Cox should be congratulated
for this, there were also some very serious
flaws and we are most anxious that
mistakes made then not be repeated on
this occasion. It is very urgent that Stage
II of the Crocodile Project go into force,
but this must be done properly. CSG is
most happy to provide its expertise and
advice in relation to this, both to FAO and
the Indonesian Government. In fact CSG,
as you’ll note from the report, is working
very closely and hard to help the
Indonesian Government with its Crocodile
Management Program.

I do hope that Mr. Child is enjoying
his retirement and we look forward to
hearing the name of his replacement and
to working closely with him. I have stated
many times in the past that there is far too
little cooperation and communication
between the FAO office in relation to
crocodiles and the CSG. I do hope we can
look forward to some real cooperation in
the future. It might save many people a
lot of time and money. With best wishes.

Yours sincerely,
Professor Harry Messel, Chairman CSG.

PERSONALS

Dr. Philip Hall, 111
Iceland Dr., Huntington
Stn., NY 11746, USA,
has returned from a year
in Dire Dawa, Ethiopia,
where he was teaching
wildlife management at Alemarya University.
Phil’s tenure there was beset by the turmoil of
civil strife and he reports frequent gunfire on
campus and disrupted class schedules. These
distractions did not prevent him from courting
and marrying Enumiam Zerihun. Phil and
Enumiam have returned together to New York
where Phil is recuperating from a stressful year
on the firing line and looking for jobs in
crocodilian research. The CSG wishes Phil and
Enumiam every happiness in their new life
together.

Louis Hays-Odum, c/o Andy Odum, Toledo
Zoo, 2700 Broadway, Toledo OH 43609, USA,
has completed her PhD entitled SOME ASPECTS
OF THE ECOLOGY AND POPULATION DYNAMICS
OF AMERICAN ALLIGATORS IN TEXAS, at Texas
A & M University. Congratulations Louis.
conservation of some species of crocodilians. BBC approached CSG for information on this topic after the series producer, Gillian Grey, read the CSG ACTION PLAN. Executive Officer Perran Ross will be interviewed on the air explaining crocodile conservation programs. The program will air around the world on Sunday, 10 January at 0415 GMT, Monday, 11 Jan. at 1930 GMT and Tuesday, 12 Jan. at 0915 GMT.

R. Arumugam and Ms. Smita Satheesh are new staff at the Madras Crocodile Bank, Post Bag No. 4 Mamallapuram, 603 104 T.N., S. India. Mr. Arumugam is an MSc graduate who will be involved in a five year study of Crocodylus palustris. Arumugam has been studying the ecology of large mammals with emphasis on predator prey relationships. Ms. Sateesh has been carrying out a survey of muggers in Tamil Nadu and will also be involved in the long term study.

CSG MEETING SCHEDULE 1993-94. To assist members plan their year the following tentative schedule of meetings of the CSG, CSG Steering Committee and related events is proposed. Confirmations of these dates and locations will be publicized in the NEWSLETTER.


12-13 March 1993--Steering Committee Meeting, Darwin, Australia.

14 March 1993--Meeting of the Asian Conservation and Sustainable Use Group, Darwin, Australia.

15-19 March 1993--CSG Regional Meeting, Darwin, Australia.

15-16 September 1993--Steering Committee Meeting, Paris, France, in conjunction with the Paris Leather Show.
4-8 October 1993—CSG Review Committee of Thailand crocodile management.

9-16 October 1993—CSG Review of Indonesian crocodile management.

17-24 January 1994—CSG Steering Committee Meeting in conjunction with IUCN General Assembly, Buenos Aires, Argentina.

30 April-1 May 1994—CSG Steering Committee Meeting, Pattaya, Thailand.

2-6 May 1994—12th Working Meeting of the CSG at Pattaya, Thailand.

October 1994—CSG Steering Committee Meeting in conjunction with Meeting of the Parties to CITES, Denver, USA.

SECOND REGIONAL CONFERENCE OF THE IUCN-CROCODILE SPECIALIST GROUP, DARWIN, AUSTRALIA, 1993. This meeting for the Eastern Asia, Oceania and Australasian region will be hosted by the Conservation Commission of the Northern Territory in Darwin, Australia, 12-19 March 1993. Registration still available. To receive additional information contact: Jan Peters, CSG Conference Coordinator, Conservation Commission of the Northern Territory, P.O. Box 496, Palmerston N.T. 0831, Australia. Phone 618 989 4449, Fax 618 932 3849.

The CSG NEWSLETTER is produced and distributed by the Crocodile Specialist Group of the Species Survival Commission, IUCN - World Conservation Union. CSG NEWSLETTER provides information on the conservation, status, news and current events concerning crocodilians, and on the activities of the CSG. The NEWSLETTER is distributed to CSG members and, upon request, to other interested individuals and organizations. All subscribers are asked to contribute news and other materials. A voluntary contribution (suggested $40.00 US per year) is requested from subscribers to defray expenses of producing the NEWSLETTER. All communications should be addressed to: Dr. J. P. Ross, Executive Officer CSG, Florida Museum of Natural History, Gainesville, FL 32611, USA.

ITS A CROC'S LIFE-ODE TO THE CSG

Lying peacefully in my pool when along comes some fool, and plots my sexual habits graphically.
I was moved down to a farm, quickly met a lovely ma'am, now she's popping out those clutches prolifically.

Where's my tail?
Can't possibly be for sale,
CITES hasn't microchipped or tagged it.
Humanely extracted, the pain was protracted, if I don't watch out I'll lose me vital bit!

The next thing we know, I'll be on a TV show, then fame and fortune will be ours ad-infinium.
Then the truth will be out, what a croc's life's all about.
See those humans, lick your lips, and then go and bite 'em.


EDITORIAL POLICY - The newsletter must contain interesting and timely information. All news on crocodilian conservation, research, management, captive propagation, trade, laws and regulations is welcome. Photographs and other graphic materials are particularly welcome. Information is usually published, as submitted, over the author's name and mailing address. The editors also extract material from correspondence or other sources and these items are attributed to the source. The information in the newsletter should be accurate, but time constraints prevent independent verification of every item. If inaccuracies do appear, please call them to the attention of the editors so that corrections can be published in later issues. The opinions expressed herein are those of the individuals identified and, unless specifically indicated as such, are not the opinions of the CSG, the SSC, or the IUCN-World Conservation Union.
Steering Committee of the Crocodile Specialist Group

For further information on the CSG and its programs, on crocodile conservation, biology, management, farming, ranching, or trade, contact the appropriate officer on the Steering Committee:

Chairman: Prof. Harry Messel, School of Physics, University of Sydney, NSW 2006, Australia. Tel: (61) 2 692 3383 Fax: (61) 2 660 2903. Deputy Chairman: Prof. F. Wayne King, and Executive Officer, Dr. J. Perran Ross, Florida Museum of Natural History, Gainesville, FL 32611, USA. Tel: (1) 904 392 1721 Fax: (1) 904 392 9367.

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CITES Observers: Dr. Obduolo Menghi, Scientific Coordinator & Jaques Berney, Deputy Secretary General, CITES Secretariat, Case Postale 78, CH-1000 Lausanne 9, Switzerland. Tel: (41) 21 200 081 Fax: (41) 21 200 084.