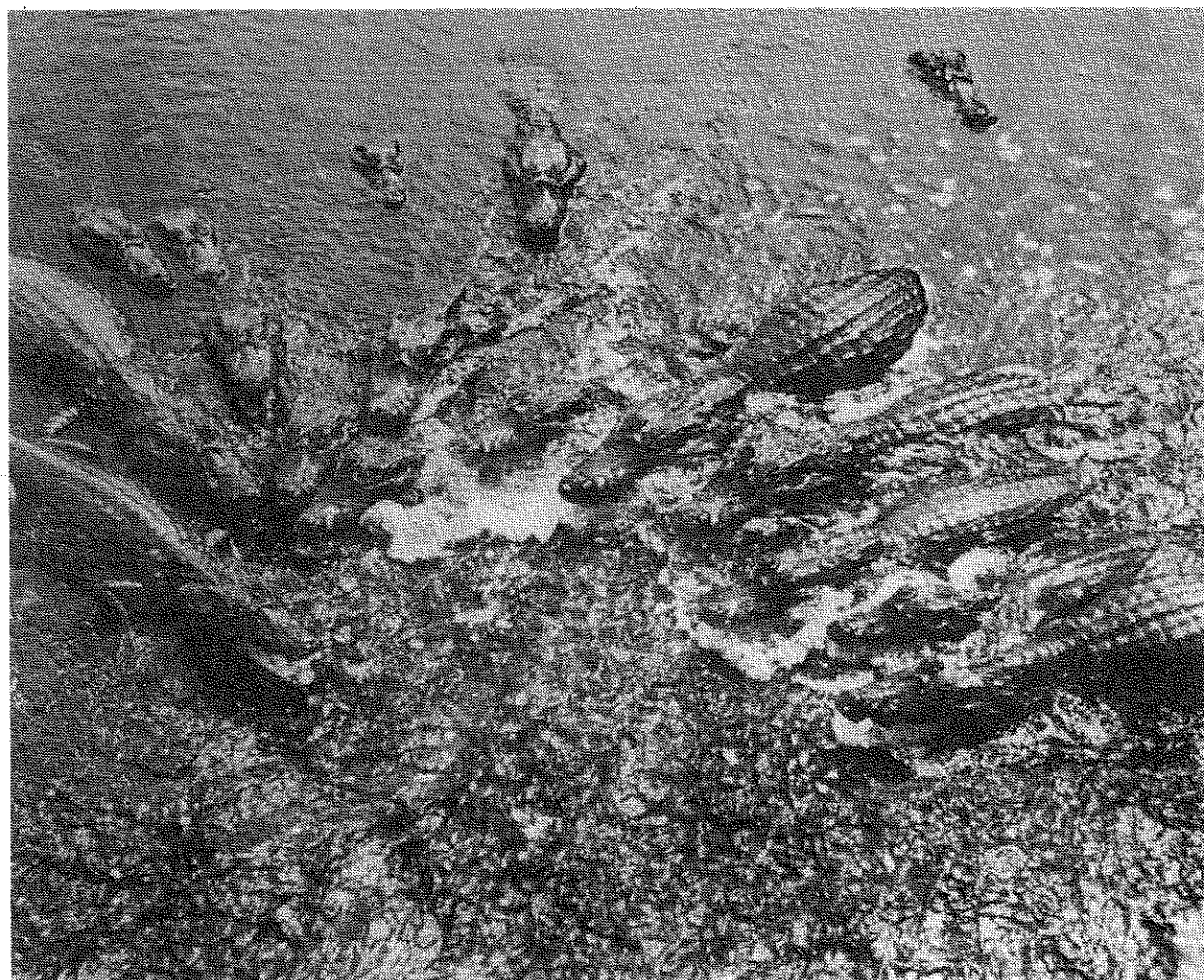


CROCODILE SPECIALIST GROUP

NEWSLETTER

VOLUME 10 No. 2 ■ APRIL 1991 - JUNE 1991



IUCN World Conservation Union ■ Species Survival Commission

CROCODILE SPECIALIST GROUP

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VOLUME 10 Number 2
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IUCN--The World Conservation Union
Species Survival Commission

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COVER PHOTO: Social fishing behavior in
Caiman yacare, Miranda, Mato Grosso do
Sul, Brazil. See article, page 13. C.
Yamashita photo.

PATRONS

The following Patrons of the CSG have contributed more than U.S. \$500.00 during the past 12 months and are listed by size of donation, largest first. The funds donated have been deposited with University of Florida Foundation, Inc., and are used to support the CSG program:

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OBITUARY

Professor Angus D'Albini Bellairs, Emeritus Professor of the University of London and distinguished herpetologist died on September 26th 1990. Professor Bellairs was a founding member of the Crocodile Specialist Group and his death marks the end of an era where it was possible for one man to know virtually everything about all reptiles.

Angus Bellairs was born on January 11th 1918 and educated at Stowe School, Queens College, Cambridge and University College Hospital, London. Interested in natural history, and especially in reptiles, he was able to combine zoology at Cambridge with traditional medical subjects. He graduated in 1939 and qualified in medicine in 1942 and was called up into the Army Medical Corps. He was posted with the fourth Divisional Engineers and saw action in North Africa, Tunisia, Egypt and Italy. He was then posted to Burma. Everywhere Angus went he collected reptiles and there was a rumor (which he may have encouraged) that anyone who reported sick with a reptile in a tin was bound to receive a day off duty. His collections were carefully preserved and deposited at Cambridge and served him throughout his subsequent career.

Following the war, Professor Bellairs took up a position as Lecturer in Anatomy at London Hospital Medical College where he could combine his zoological and medical training. In 1951 he moved, with his mentor J.D. Boyd, to Cambridge as Lecturer in Anatomy and returned to London in 1953 to take up promotion to Readership in Anatomy at St. Mary's Hospital Medical School where he remained happily until his retirement in 1982. In 1970 Angus Bellairs was awarded a Chair of Vertebrate Morphology at the University of London and became

Emeritus Professor upon his retirement. He held an honorary appointment as consulting biologist to the Zoological Society of London and was a founder member of the British Herpetological Society in 1947. He was also a member of the Anatomical Society of Great Britain, and the Linnean Society, an honorary member of the British Herpetological Society and of the American Society of Ichthyologists and Herpetologists, and a Fellow of the Institute of Biology.

Angus Bellairs made a number of scientific travels. In 1953 he studied and collected reptiles in Algeria with an award from King's College, Cambridge. He obtained a Royal Society and a Nuffield Foundation Scholarship to visit South Africa in 1955 and enjoyed the zoology there, especially the crocodile watching. In 1970 he was visiting Professor of Zoology at University of Kuwait where, due to his high reputed moral integrity, he was put in charge of the women student's field excursions, teaching them to handle reptiles without fear. In 1973 he took part in an expedition to study the giant tortoises of the Galapagos.

He remained active after retirement and in 1985 was a speaker at the International Crocodile Conference in Darwin NT. Despite his advancing years he was interested in every adventure and enjoyed crocodile surveys, peering out of the doorless helicopter at the reptiles beneath and trekking through tropical swamps. He formed a lasting friendship there with Dr. Grahame Webb, whose novel writing ability he much envied. He achieved his ambition of writing his own successful novel with the publication in 1989 of the "The Isle of the Sea Lizards", a herpetological thriller with an unusual mixture of reptile biology and university politics. The book was launched at the First World Congress of Herpetology where he was the Honorary President of this, the largest gathering of reptile experts ever held.

Angus Bellairs authored about eighty publications and his works covered reptiles, as well as mammals and birds. His major studies on the structure and development of the skull are summarized in his monograph in the important "Biology of the Reptilia" series. Although Angus enjoyed collaboration with his friends, he preferred to pursue little known subjects in his own way and often referred to himself as a "scientific antique collector". He authored three books, which have been extensively republished

and translated, in which he provided a synthesis of knowledge on reptiles and stated, " nothing reptilian is alien to me".

Angus Bellairs' death is a serious loss to the international reptile community. It marks the passing of a friendly, gentle man who was always knowledgeable about reptiles and delighted to talk about them in his unique happy style. Angus Bellairs will be remembered as the archetypal British Professor, intelligent, well read, a fascinating raconteur, mildly eccentric, extremely embroiled in his subject, and always happy to help and encourage others.

He is survived by his wife Ruth and their daughter Vivien, to whom we extend our deepest sympathies. -- Professor Mark J. Ferguson, *School of Biological Sciences, University of Manchester, Coupland Street, Manchester, M13 9PL, U.K.*

STEERING COMMITTEE

CROCODILE SPECIALIST GROUP STEERING COMMITTEE, MINUTES , 30 MAY 1991, TOKYO, JAPAN

Present: H. Messel (Chairman), J. Hutton, N. Ishii, T. Joanen, P. Ross, K. van Jaarsveld, G. Webb, T. Yamanaka. CITES Observer: J. Berney. Observers: B Angsirijinda, D. Ashley, P. Ashley, Z. Casey, J. Cox, Y. Kaneko, W. Sagera, Y. Takahara, C. Youngprapakorn.

Professor Messel opened the meeting at 8:05 pm. Steering Committee members were in Tokyo for a symposium on sustainable use of wildlife sponsored by JLIA and had taken the opportunity to hold a Steering Committee meeting.

Finances. Accounts and budgets are now developed quarterly and annually. A summary for the second quarter of 1991 was presented. Balance at the end of the first quarter was \$10,813.22, revenue during the second quarter to date was \$10,200.15 and expenses were \$6,643.11 leaving a balance at 25 May of \$14,370.26. Total donations for the year are \$26,090 and significant income is being realized from miscellaneous sales (\$3,740). Detailed receipts and accounts of

all revenues and expenses are available for scrutiny. Estimated annual core costs for running the CSG remain at about \$55,000 per year. Significant new expenses are being experienced for Mail and Phone which are no longer provided by other institutions. The need for significant additional donations to cover running costs of the CSG for the remainder of the year was discussed. A recent appeal to patrons had resulted in increased donations as well as valuable ideas on the expansion and stabilization of support for the Group. Professor Messel expressed his great appreciation to patrons for their continued assistance.

Several participants pointed out that clear accounting was a great incentive to potential donors who could see how their donations were being well used. Professor Messel indicated that in future the CSG accounts could be published in the NEWSLETTER.

Jon Hutton announced that the Crocodile Farmers Association of Zimbabwe (CFAZ) was contributing to the running expenses of the African regional office and an amount equivalent to about US \$10,000 in local currency had been pledged. He also announced that The Peoples Trust for Endangered Species had donated a grant of US \$30,000 to support a study of the survival of crocodiles released from farms into the wild. An announcement to recruit a suitable researcher in Africa has been circulated.

Jon also described a recent initiative of CFAZ with its Japanese buyer to successfully develop a product tag that will accompany manufactured products produced from Zimbabwe Nile Crocodiles. The cardboard tag has an attractive logo and explains that the product is made from crocodile skin produced in a sustained management and conservation program and that a portion of the purchase price will be donated to the Japanese Nagao Conservation Foundation. The Nagao Foundation will then distribute funds to support crocodilian conservation. Professor Messel and the Group praised this initiative as a model of how sustainable use and commercial enterprise can be linked to consumer education and fundraising for conservation.

Jon Hutton asked whether the distribution of SSC Action Plans was cost effective and whether, if Action Plans were distributed to a more restricted audience, the funds saved could be used to help Specialist Groups. Prof. Messel replied that the action plans were funded from a

special endowment that was not available for other purposes and that the SSC Steering Committee felt that the Action Plans were the most concrete and visible evidence of SSC action and deserved the widest possible circulation.

Additional Deputy Vice Chairmen. In response to letters from Ted Joanen and Kevin van Jaarsveldt to the Chairman, discussion was held on adding another Deputy Vice Chairman for Trade from the American region. Discussion of the regional representation most needed and of some potential candidates was held. Professor Messel closed the discussion after stating that he expected to be advised by the relevant Vice Chairmen on the need and nominations for such a position.

CITES - 1992 proposals review. Proposals for changes in the CITES appendices based on ranching operations were received by the Secretariat from Madagascar, Kenya, Tanzania and Indonesia by the deadline of 7 April 1991. Draft proposals of resolutions on criteria for transferring crocodiles between appendices based on ranching, and on universal marking systems were also in preparation. The need for timely review and careful scrutiny by the broadest cross section of appropriate CSG members was recognized and a schedule and procedure to ensure this was outlined. These proposals must receive preliminary review and be returned to the applicants for revision and final submission by 4 October. Additional proposals for appendix changes must be received by 4 October and all proposals will be available for final review by CSG shortly thereafter. Amie Brautigam of the Trade Specialist Group was providing text of the proposals and the Chairman of CSG was coordinating with the executive officer to distribute them for review. In addition to the review of proposals, the CSG can route comments directly through the Secretariat and its committees, through our Vice Chairman for Trade Monitoring, Ginette Hemley, and of course, directly during the CITES meeting process. It was agreed that the CSG position on the various proposals be discussed and consolidated at the next Steering Committee meeting (proposed for Colombia in November 1991) after the proposals have been reviewed.

CITES Crocodile Review Groups. Final composition of the review groups established

during the Steering Committee meeting last April in Gainesville was announced as follows : Africa - H. Messel, W. King, W. E. Waitkuwait (coordinator for French speaking Africa), O. Behra, K. van Jaarsveldt (coordinator English speaking Africa), J. Hutton, J. Kundaali (CITES secretariat); Asia and Oceania - H. Messel (coordinator), W. King, G. Webb, Y. Takehara, J. Cox, B. Vernon, J. Berney (CITES secretariat); South and Central America and the Caribbean - H. Messel, W. King (co-coordinator), N. Scott, O. Menghi (CITES Secretariat & co-coordinator) J. Villalba-Macias, G. Hemley, D. Jelden, A. Eloy Siejas, J. Hutton. These review groups will assist CITES to review proposals and activities in the regions and each group will also contain a scientific counterpart from the country under review for a given issue.

11th working meeting preparations, Zimbabwe. Venue and dates for the meeting are as reported in the last NEWSLETTER, 2 to 7 August 1992 at Victoria Falls. The organizing committee of Kevin van Jaarsveldt, Jon Hutton and Mr. Strath Brown (President of CFAZ) is active and has engaged 2 staff to assist in preparations. A preliminary call for registrations has been circulated in the NEWSLETTER. There is a need to provide a broad range of costs for accommodations including some cheap possibilities. The schedule of speakers is being prepared by Val Lance and Mark Ferguson and it was explained that the schedule will focus around keynote addresses on major issues and that the more routine reports would be encouraged to be made as poster presentations. It was requested that a few speaking slots be kept available for younger presenters (graduate students, etc.). Kevin van Jaarsveldt commented that some confusion had resulted from the apparent vacillation by CSG between alternate venues after the Zimbabwe venue had been approved at the last Steering Committee meeting. The Chairman agreed that decisions made by him at the Steering Committee meetings should be stuck to without subsequent vacillation.

Regional meeting of the CSG, Santa Marta, Colombia, 11 - 14 November 1991. Plans for this meeting were proceeding satisfactorily now that both the management authority (INDERENA) and the Colombian Association of Wildlife Farmers were sponsoring the meeting.

Preliminary calls for registration had been circulated. Prof. Messel requested that the next Steering Committee meeting be held immediately prior to this meeting as a large proportion of the Steering Committee apparently intended to be there. He suggested the two days 9-10 November be set aside for the Steering Committee and that substantial discussion of the Caiman issue be held at that time.

Sustainable Use debate. Considerable response and exchange of letters had been stimulated by Prof. Messel's letter submitted to WILDLIFE CONSERVATION Magazine. The draft letter has been widely circulated and lengthy rebuttals and counter rebuttals prepared. Recently WILDLIFE CONSERVATION informed the CSG they would not publish the letter and so it has been submitted in modified form to SSC SPECIES Newsletter. In response to a comment concerning the Canadian customs brochure in CSG NEWSLETTER, vol 9(4), correspondence was exchanged between Prof. Messel and Mr. R. Campbell, Administrator of CITES in Canada. This clarified the stance of Canada in favour of sustainable use [see letters below].

Crocodile Action Plan. The draft action plan text has been finalized and submitted to SSC for publication. It requires maps and photographs and will be reviewed by the IUCN publications advisory group and then produced by SSC.

Introduction to Farming of Crocodiles. This valuable manual compiled by Jon Hutton and Richard Luxmoore is now complete and it is proposed to append it to the Directory of Crocodile Farms being published by Wildlife Conservation Monitoring Center (WCMC). Prof. Messel noted that this manual is a very valuable source book for farmers and is strongly complimentary to the recent FAO publication, 'Management of Crocodiles in captivity' by Melvin Bolton. It was hoped that the CSG Manual could be published quickly. The Bolton / FAO manual is already difficult to find due to low supply and the executive officer was instructed to write to Mr. Gil Childs of FAO requesting that Bolton's manual be reprinted to ensure its wide availability.

Crocodile management policy in Vanuatu. Prof. Messel informed the group of a recent survey of crocodiles in Vanuatu that contained the rather

surprising recommendation that the few remaining animals of this easternmost range extension of *C. porosus* be allowed to become extinct. The population had already been reduced to very low numbers by a combination of natural phenomena and hunting, and local people were opposed to the crocodile's presence. A claim that this is a recently introduced population cannot be substantiated. Prof. Messel announced that this recommendation was contrary to the policy of CSG to prevent extinction of crocodile populations and was unacceptable. Discussion followed on how high a priority to give this issue and what level of response was appropriate. It was agreed that Prof. Messel would take up this issue with authorities in Vanuatu.

Nile Crocodile Report. This report, originally prepared by Jon Hutton, for the CITES secretariat and meeting of the parties in 1990, contains a useful summary of information on the situation of Nile crocodile conservation in Africa and has now been prepared in a format suitable for publication. Jon asked whether it should be published as a CSG publication and whether CITES might pay for the production. No response was recorded.

Indonesia. The up to date situation in Indonesia with regard to the FAO crocodile project there was presented by Jack Cox. Jack reported on the success of surveys in Kalimantan and Sumatra last year and gave a review of the current state of crocodile farming [see regional reports]. Funding for the project has been uncertain since the beginning of the year and the project was only able to continue with interim funding from WWF and this would run out 31 May. Operations of the project would therefore be suspended until an alternative donor could be located. This would seriously imperil the conservation gains of the project to date that had been enhanced by recent visits to Indonesia by Grahame Webb and Hank Jenkins. A proposal to down list Indonesian populations to Appendix II has been prepared with consultation from Webb and Jenkins.

Discussion followed on the ramifications of this situation in regard to CITES and future trade. Trade irregularities continue, despite a reduction, and there are recent reports of tampering with CITES tags. The sustainability of the current harvest is in serious doubt. Yoshio

Kaneko summarized the difficulties encountered by the Japanese Government in continuing funding for the project. A consensus was reached that future trade in crocodile skins from Indonesia should be contingent upon the presence of an effective management scheme and that the FAO project seemed the main source of management guidance. Continued funding for the project is therefore a priority. With a total trade of 30,000 to 40,000 skins /year Indonesia was generating sufficient revenue to fund a substantial portion of the management costs from skin sales, as was done in many other countries. Outside seed funding of a proportion of the costs of management would be an inducement to Indonesia to tax its producers and traders and raise the necessary funds. The possibility and mechanism for CSG calling for a complete transfer of Indonesian populations to Appendix I and ending all legal trade was discussed. If possible, the FAO project should continue. Funding for the project is the joint responsibility of those benefiting from the trade, that is, the Indonesian producers and traders and the Japanese buyers. A funding proposal based on matching funds raised from revenues generated by the croc trade in Indonesia was desirable. Hard evidence of illegal trade should be reported to the CITES infractions Committee. The CSG's concern was conservation of crocodile populations and that with this in mind it would scrutinize the situation, and any CITES proposals, at the next Steering Committee meeting with the possibility of recommending a complete end to trade if necessary.

The meeting then adjourned at 10:30pm to reconvene at 11:00pm.

Thailand. Jaques Berney summarized the present position of Thailand with regard to wildlife trade. After over ten years of inadequate implementation of CITES and numerous irregularities of wildlife trade, the CITES Standing Committee recommended in April that all parties cease wildlife trade with Thailand, instituting an effective ban. Mr. Charoon Youngprapakorn expressed the great concern of the Sumatprakan Crocodile Farm, the only registered croc farm in Thailand, which was suffering severe economic stress as a result of the trade ban. He had asked Professor Messel and the CSG to intervene on behalf of the farm to alleviate the situation. Prof. Messel explained

that CSG would only consider acting if prompt and effective action was taken to upgrade the situation of crocodile conservation in Thailand. Specifically, to control the illegal trade of Appendix I species from Cambodia into Thailand, to ensure compliance of farms in Thailand to CITES regulations, to institute effective management and conservation of wild crocodiles in Thailand starting with an effective survey, and to eliminate Thailand's position in the trade in illegal skins (particularly Caiman) from other countries. It was unfortunate that a founder member and long time supporter of the CSG was bearing the economic burden of the situation but the responsibility lay with Mr. Youngprapakorn and his colleagues to put pressure on their government and other producers to improve the situation.

Discussion was held on what the CSG position would be on the farm completing contracts for croc skin sales signed but not shipped prior to the ban, and on a selective easing of trade restrictions for registered farms if necessary action was begun. New legislation is being considered by the Thai government. It was stressed that alleviation of trade restrictions could only be considered after firm evidence of improvements was visible.

Grahame Webb reported that there was intense interest and development in crocodile farming in Thailand and the newer farms had joined in an Association that intended to initiate conservation action, surveys, etc. He noted that the large trade in *C. siamensis* from Cambodia was said to come from numerous small village farms and the connection of these animals to wild stock was not known. Such small farms are also very common in Thailand. The trade ban had galvanized concern and interest in improving the situation and now was a timely point to provide aid to Thailand to achieve the necessary changes. However Prof. Messel stressed that he was unwilling to consider too rapid an alleviation of the trade restrictions as this might be misinterpreted as a softening of position and encourage a return to unacceptable trade and management practices.

Mr. Youngprapakorn responded saying that while it was hurting his family financially he agreed with the ban in principle because it had drawn the serious attention of the government to major problems and the need for change. The ban had received wide publicity in Thailand. He noted that the Sumatprakan farm has an effective

breeding program and will quickly become overcrowded if it continues its production of approximately 6000 new hatchlings a year. He has sent letters to the Prime Minister, Minister of Agriculture, the Director General of Forests and other government leaders, calling on them to fully enforce CITES. The farm was now tagging all skins to ensure legality of trade and was open to inspection by any party. Thousands of crocodiles on the farm are being tagged with microchip transponders, the first facility in the world to adopt this new technique. The farm has also suspended sales of hatchlings to new farms until the situation clarifies. The new crocodile farmers association was beginning a program to assist wildlife authorities survey wild populations and hoped to present a report at the Zimbabwe meeting.

In the following discussion these points were made, Thailand was heavily populated and limited habitat remains for wild crocodiles. It was clearly unacceptable to deplete Appendix I crocodile populations in neighboring countries to build the farms in Thailand. Many new farms may not be able to establish registered status with CITES because their stock is illegally obtained from Cambodia, although parallel situations in Africa and Singapore have been resolved in the past. The caiman trade is run by a different set of people from the crocodile farmers. In summary it was agreed that when evidence of an improvement of the situation was received, the CSG could consider recommending an easing of trade restrictions for registered farms, but that lacking such evidence, no immediate action was possible. The group agreed to reconsider the matter at the next Steering Committee meeting with whatever additional facts were at hand.

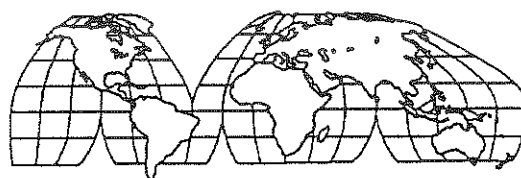
Zambia. Allegations and correspondence concerning illegal activities from some farms in Zambia were reviewed. Several private farms not involved have protested that they are being accused and penalized for activities of other government farms outside their control. It was stressed that the infractions are real and well known in the region and that failure to recognize or act upon them would destabilize confidence in CITES and in the CSG throughout Eastern Africa. CSG has recommended to CITES that an unbiased observer be sent to review the situation, however CITES is constrained because they can only send an observer at the invitation

of the country concerned, which has so far not been forthcoming. After discussion, CITES was urged to continue attempts to send an observer and the Group would defer action until more information was available.

Vietnam. Grahame Webb reported a rumor concerning the export of a number of Cuban crocodiles (*C. rhombifer*) to Vietnam. The executive officer was asked to investigate if possible during the CITES mission to Cuba planned for June.

The meeting closed at 11:40 pm. J.P. Ross, rapporteur.

AREA REPORTS



AFRICA

Botswana

NGARANGE CROCODILE FARM. A Botswana company formed to rear crocodiles for skins and tailmeat, are seeking investors. The Gaborone based company, Ngarange Crocodile Farm Pty. Ltd. is seeking capital, machinery and technological investment for its 50 hectare site on the Okavango River. The Okavango is said to be the best crocodile habitat in the republic. Ngarange also sells live crocodiles domestically and abroad. *from LEATHER May 1991. -- Kadir Donmez, University of Cincinnati, LIA Laboratory, Cincinnati, OH 45221-0014, USA.*

The Gambia:

CROCODILES DECLINE IN WEST AFRICA. Surveys conducted by Dr. Scott Jones and colleagues, of University of Bristol, indicate very low numbers of most crocodiles in this region. Based in Gambia, where the most northerly canopy forest and *Osteolaemus* persist, the group has surveyed in The Gambia, Senegal, and Guinea-Bissau for 3 sp. of crocodile in conjunction with faunal surveys of other

vertebrates. *Crocodylus cataphractus* has not been found in 3 years of surveying and is presumed extinct in these countries. *C. niloticus* has numerous breeding populations in each country but continues to decline. *Osteolaemus* survives in Gambia as a single population of about 12 individuals. In Senegal there are two slightly larger populations and in Guinea Bissau things are slightly better. Habitat loss, particularly removal of canopy cover, has caused hydrological changes and essential wet season forest pools needed by *Osteolaemus*, no longer form.

In the Abuko Nature Reserve in Gambia over the last three years a series of plastic pools irrigated with plastic piping were buried in the forest floor. *Osteolaemus* immediately colonized these artificial pools and bred in them providing the first successful recruitment in this remnant forest fragment since 1981/82.

The team will coordinate with scientists from UK and Czechoslovakia to survey a new national park on the Black Volta river in Ghana. preliminary surveys indicate all three species are present in this riparian habitat. In Nigeria three species are reported, but *C. cataphractus* is said to be represented by a single individual. While this report needs verification it is obvious that throughout their range, *C. cataphractus*, and to a lesser extent *Osteolaemus*, being nocturnal forest dwellers, are predisposed to disappearing without anyone noticing. Jersey Wildlife Preservation Trust is involved in setting up a seminatural enclosure at Port Harcourt, Nigeria, for crocodile conservation for all three species. -- Scott Jones, *Department of Zoology, University of Bristol, Bristol, BS8 1UG, U.K.*

South Africa:

NILE CROCODILE FARMERS ASSOCIATION NEWS. The breeding season, which has just finished, has seen a fairly good production of hatchlings; however, because of the improved availability of hatchlings we have seen a substantial drop in price from over R200 down to R110 each. The production of skins in 1992 will increase substantially with approximately 20,000 skins coming onto the market. In the last six months two impressive commercial rearing units have been established as extensions of established breeding operations, one in Transvaal and one in Natal.

The proposal to CITES for downgrading of South African populations of *C. niloticus* to Appendix II has been prepared by David Blake and after approval by provincial authorities and discussion by the NCFA and the Transvaal Department of Nature Conservation, the proposal has been forwarded to the CITES secretariat for review and consideration at the meeting of the parties in 1992. In response to the opposition to animal use expressed by some international conservation groups the NCFA has called upon all members to ensure that their crocodiles are kept under good conditions and slaughtered humanely. -- NCFA NEWSLETTER (4) & H. Kelly, *Riverbend Crocodile Farm, P.O. Box 245, Ramsgate, 2485, South Africa.*

NILE CROCODILE IN SOUTH AFRICA. The Nile crocodile, *C. niloticus*, in South Africa occurs from the Limpopo river in the north to the Tugela river in the south. Historically it had a far greater distribution. The species was recorded from the southeast coast of Cape Province, as far south as the Keiskamma river but has been extinct in the eastern Cape for more than 150 years. Excessive and uncontrolled hunting for hides seriously depleted local populations and crocodiles were also destroyed as they posed a threat to humans and livestock. In recent years pollution and habitat destruction has had an impact, especially in the Transvaal. Poaching for medicinal purposes occurred but has not been quantified. Problem crocodiles are now destroyed or captured and relocated to commercial farms but it is not recorded how many crocodiles have been transferred to commercial farms in the R.S.A.

Comprehensive surveys have not been done in recent years but it is estimated that Natal has 4,400 crocodiles in the wild and in game reserves. Most of these occur in Lake St Lucia, Ndumu Game Reserve, Lake Sibaya, Mzingazi lake, the Umfolozi and Hluhluwe rivers, Upper and Lower Pongola rivers and the Pongolopoort Dam. Overall the population in the province appears stable although increases have been noted in some areas such as Lake St. Lucia. Widespread habitat destruction, poaching, incompatibility with livestock production and competition with people for resources ensure that the Nile crocodile has little chance of survival outside protected areas in Natal.

Transvaal has approximately 4,000 crocodiles in the wild. About 3000 of these occur in the Kruger National Park while the remainder occupy the Sand, Komati, Klaserie, Lower and Upper Oliphants, Blyde, Letaba, Pongola, Mogol, Limpopo, Crocodile, Sabie, Levubu, Mutale, and Magalakwena rivers. Jacobsen (1984) reported that only seven of these rivers have breeding females, the Upper and Lower Oliphants, Limpopo, Letaba, Levubu, Komati and Blyde rivers. Habitat destruction, particularly rivers drying up because of damming, water removal for irrigation, and water pollution, have had an adverse effect on crocodiles. In some areas such as Loskop Dam, Mutale, Levubu, Komati and Crocodile rivers, reductions in the population have been noted. However increases have been noted elsewhere, particularly in the Limpopo and Letaba rivers but this may be the result of deteriorating conditions in the Kruger National Park.

Crocodile farming has become an enormous industry in South Africa with 34 farms operating at present and total investment in the industry is estimated to exceed R40 million. Development of farms has accelerated recently with one farm in 1970, 3 by 1980, 16 by 1985, 24 by 1989 and 34 by 1991. As the Nile crocodile in R.S.A is listed on Appendix I of CITES, international trade has been prohibited and the local industry has had little effect on wild crocodiles.

In Natal, problem animals and several hundred hatchlings from doomed nests that would not have hatched in the wild have been transferred to the farms. However, this is small scale and strictly controlled by the Natal Parks Board. The authorities in Transvaal do not sell any crocodiles to farmers. Despite a variety of production problems faced by farms, reflected in the very low number skins produced for export, virtually no funds have been made available by the industry for research. An MSc project on nutrition of Nile crocodiles is nearing completion at the University of Pretoria. Most of the breeding stock on the farms has come from Zimbabwe, Botswana, Mozambique and Namibia, but stock is becoming available from local captive bred sources.

Skin production has been limited with South Africa producing less than 1.5% of the world production of classic skins in 1988. South Africa produced less than 6% of the Nile crocodile skins produced that same year. Skin sales commenced in 1985 and annual exports have been 579 (1985),

83 (1986), 658 (1987), 1,884 (1988) and 4,623 (1989). A recent development has been the development of an internal market for captive bred hatchlings that are purchased and raised for the skin market. The current world market for classic skins may cause some smaller operations to close down and there are five or six significant producers who will produce most skins in the future.

The Nile crocodile faces a bleak future in the wild in South Africa. More and more habitat is being destroyed as areas are developed and available water utilized. The local crocodile industry is increasing the production of farmed skins and it will be interesting to note the effects of price instability and pressure from animal protection activists on the local industry. -- J. Marais, *Crocodilian Study Group of Southern Africa*, P.O. Box 414, Bothas Hill, 3660, South Africa.

Kenya:

MAMBA VILLAGE CROCODILE FARM reports that from December 1989 to April 1990 92 nests were collected from 114 breeding females, and 2,562 hatchlings hatched from 3,112 eggs; 12.3% of the eggs were infertile. Between December 1990 and March 1991, 102 nests were collected from 119 breeding females and 2,840 hatchlings were obtained from 3,547 eggs and 13.8% of the eggs were infertile. On their Tana River ranching operation a quota of 1,500 eggs was allocated by the Kenya Wildlife Service for the period December 1989 to April 1990. A total of 22 nests with 785 eggs were collected and 708 hatchlings hatched from them. From December 1990 to March 1991, 27 nests with 831 eggs were collected and produced 753 hatchlings. The farm is conducting experiments on the effects of feeding space on growth rate and mortality and on the effect of rearing young crocodiles in different sex groups on their growth rates. -- Ariel Zilber, *Manager & Yuval Regev, Farm Manager, Mamba Village, P.O. Box 85723, Mombasa, Kenya.*

Uganda:

WILDLIFE EXPORT HALTED. The Uganda Wildlife Department has suspended issuing new licences for the export of wildlife while it reviews activities and reorganizes the Department to establish a workable wildlife policy. Uganda is

not a member of CITES. -- Yohannes Gezahegn, *Lavitta (U) Ltd., P.O. Box 707, Kampala, Uganda.*

Zambia:

Dr. Malumo Simbotwe has been busy writing crocodile project proposals for clients in Zambia. The industry is growing rapidly in Zambia with ten crocodile farms established. The Department of Wildlife and National Parks Service has engaged a new biologist, Dr. Nambote, as a game biologist. He brings his training as a veterinarian and an enthusiastic approach to the position. Dr. Simbotwe is still seeking funding for aerial surveys and field biology research in Zambia. He has suggested that CITES classify Zambia as a priority area for support of the crocodile management program. The Ministry of Tourism, DWNPS and Commercial Farmers Bureau all agree that there is a need to establish a long term research effort in Zambia. -- Dr. M. P. Simbotwe, *ESCC, P.O. Box 60127, Livingstone, Zambia.*

ASIA

Malaysia:

SANDAKAN CROCODILE FARM. The farm was established in 1964 and raises only *Crocodylus porosus*. In the initial years breeding success was low until Romulus Whitaker provided technical advice on breeding in 1983. In 1984 one female laid 50 eggs of which 19 hatched and by 1990 females produced 1,205 eggs but only 389 hatched as most of them were infertile. Currently the farm holds a breeding stock of 237 females and 82 males and about 1500 juveniles are being reared. The farm hopes to build its breeding stock and improve fertility of eggs laid. -- Shah Yau Look, *Sandakan Crocodile Farm, P.O. Box 633, 90007, Sandakan, Sabah, East Malaysia.*

Philippines:

NEWS FROM CFI. The RP-Japan Crocodile Farming Institute in Palawan has succeeded in breeding *C. porosus* and *C. novaeguineae mindorensis*. In 1990, 67 *porosus* and 14 *mindorensis* were hatched at the Institute. As of the end of February 1991, a total of 405

crocodiles are being kept at the Institute. This year 20 pairs of *mindorensis* and 11 pairs of *porosus* have been established. It is expected that 800 hatchlings will be produced annually in three years.

CFI is now under the directorship of Dr. Gerardo V. Ortega. Dr. Ortega finished his degree in veterinary medicine in 1987 and was formerly Assistant Director. He plans to prioritize the acquisition of breeding stock, establishing a crocodile sanctuary and formulating a comprehensive 5 year plan for CFI.

Among other ongoing research at CFI is a study of the diets of wild Philippine crocodiles from Palawan and Mindanao. Samples from the stomachs of 28 live wild crocodiles were obtained by gastric lavage and characterized. Noteworthy in the sample is the successful stomach pumping of a 5.63 m crocodile. Contents were predominantly of mammals (including human hair), with also birds, reptiles, fish, crustaceans and insects. detailed results are given in CFI News vol. 3(5) Jan-June 1990. -- CFI NEWS vols. 2 and 3, *RP-Japan Crocodile Farming Institute, P.O. Box 101, Irawan, Puerto Princessa City 5300, Palawan, Philippines, & Y. Kaneko, Yushima 2-29-3, Bunkyo-ku, Tokyo 113, Japan.*

Peoples Republic of China:

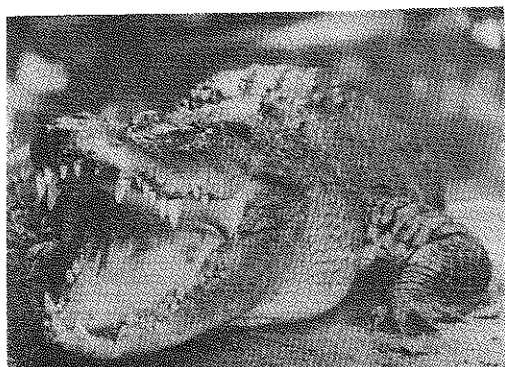
CROCODILIAN ISLAND. A new crocodile farm is being built in the Baiteng Lake, Zhuhai, Guangdong Province, PRC. The new farm is named Crocodilian Island and is planned to culture 10,000 alligators [Chinese or American? -- Eds.] and a similar number of crocodiles. The farm would like to acquire specimens of all living species in the world for culture. The farm is intended mainly as a tourist facility. -- Chen Bihui, *Biology Dept., Anhui Normal University, Wuhu, Anhui Province, People's Republic of China.*

AUSTRALIA/OCEANIA

AUSTRALIA:

INTENSIVE TROPICAL ANIMAL PRODUCTION SEMINAR, 7th & 8th August 1991, Townsville, Queensland. The two day seminar covering pigs, poultry and crocodiles, as well as general topics on production and export strategies will highlight Ted Joanen talking on development of the

Louisiana Alligator Industry. Other speakers on crocodilian topics include Vic Onions, Charlie Manolis, Harry Freeman and Mark Staton and talks cover a broad range of important issues like incubator technology, formulated foods, veterinary care, economics of farming and skin preparation. Registrations should be sent to ITAPS Committee, c/o B.M. Davis, Dept. of Primary Industry, P.O. Box 931, Townsville, Qld. 4810, Australia. -- Jack Shield, P.O. Box 652, Cairns, Qld. 4820, Australia.



Male *Crocodylus porosus*, 4 meters, at Hartleys Creek Crocodile Farm, Queensland, Australia. H. Freeman photo.

Papua New Guinea:

INCREASE IN MINIMUM SKIN SIZE FOR EXPORT PROPOSED. In response to the very reduced prices for small skins currently experienced, some producers have approached the PNG government to amend the export regulations. Exports are currently permitted for skins between 18 cm and 51 cm width. It is proposed to increase the minimum size from 18 cm to 25 cm width and to encourage the sale of smaller animals to ranches and small farms for grow out to larger sizes. This shift of exports to larger sizes would benefit both hunters and exporters in the long run. -- Kayama Sinba, *Hinterland Export Co. Ltd.*, P.O. Box 4973, Boroko NCD, Papua New Guinea.

CENTRAL AMERICA AND CARIBBEAN

Belize:

MORLETII IN BELIZE. During recent research on the freshwater turtle *Dermatemys mawii* in Belize

I spent some time in areas where turtles and crocodiles (*Crocodylus moreletii*) occur together. Older *Dermatemys* often carry the scars of close encounters with crocodiles. While crocodiles probably prey on smaller turtles, some of the larger turtle populations occur where crocodiles are common. Reductions in some *Dermatemys* populations are therefore not likely to be result of this ancient association. The turtles have more stringent habitat requirements than crocodiles, which can tolerate shallower, warmer water.

Crocodiles were encountered in Mussel Creek, Botlazz Creek, the Belize river, Spanish Creek, Freshwater Creek (Whitewater lagoon), Rio Bravo and Laguna Seca. In most of these places they are not abundant. Crocs were most common in Cox Lagoon of the Upper Mussel Creek system, Belize river watershed. Crocodiles often damaged nets set for turtles in Cox. Howard Hunt of Atlanta Zoo has been promoting the wildlife values of this area and information on land tenure in the area has been passed to him. Much of this land is private and most is for sale and so acquisition and transfer to protected status may be possible.

Crocodiles (both *C. moreletii* and *C. acutus*) are protected in Belize by the Wildlife Protection Act which continues to be renewed on a two year basis in the form of amendments. The market for crocodile skins seems to be inactive. Some crocodiles are killed illegally by rural people who dislike the presence of larger crocodiles in areas used by people.

The crocodiles of the upper Rio Bravo and Laguna Seca are secure within the Rio Bravo Conservation and Management area. There is a lot of suitable habitat in the Crooked Tree Wildlife Sanctuary. Input has been delivered to the Belize Audubon Society concerning this extensive area. -- John Polisar, *School of Forestry Resources and Conservation, N-Z Hall, University of Florida, Gainesville, FL 32611, USA.*

SHIPSTERN NATURE RESERVE SURVEY. The International Tropical Conservation Foundation (ITCF) asked me to conduct a survey in their reserve in Belize to examine the status of crocodile populations and habitat conditions there. ITCF expects that *Crocodylus moreletii* is present and possibly also *C. acutus*. I hope to visit the reserve in April and June 1991. -- Paul E. Ouboter, *Dept. of Zoology, Anton de Kom*

University of Suriname, P.O. Box 9212,
Paramaribo, Suriname.

Mexico:

CROCODYLUS MORELETII IN VERACRUZ. For several years we have been working on populations of Morelet's crocodile in the region of Los Tuxtlas in southern Veracruz, Mexico. With biologist Antonio Rangel-Rangel, I have been observing population composition and diverse aspects of the ecology and natural history, some of which is already published. This region has numerous lagoons and rivers, some of which are inhabited by *C. moreletii*, and Laguna de Nixtamalapan has been established as a reserve for crocodile preservation under the auspices of UNAM-SEDUE since 1984.

Our work is being conducted at eight localities. One important population is at Catemaco Lake, where on the north and western shores our nocturnal counts indicate a population of about 200 individuals on 10 km of swampy shore and lily pads. Individuals of diverse sizes, including the largest records for the species, have been seen and we are sure that more individuals occur here but have not been seen due to the difficult sighting conditions. In the last 3 years we have marked 45 individuals and the population appears to have maintained the status estimated by Campbell in 1972. However the crocodiles seem to be facing a critical situation with reproduction. Few nests are found on the shore and those are more frequent on islands, but we have found several nests among the lilies with the eggs exposed to the sun. We attribute this anomalous nesting behavior to the intense human pressure that occurs in the lake and on its shores.

Additional important populations have been found in the western part of the region (Municipality of Isla) where the overflows of the rivers San Juan and Tesechoacan form extensive swamps with difficult access.

C. moreletii is the typical species found in the region and we have no firm evidence of *C. acutus* there, or anywhere else in the state of Veracruz. Two live specimens of immature *C. acutus* we obtained from villagers at Catemaco were reported to come from El Real, a brackish water channel through which the Sontecomapan Lagoon flows to the sea. We have confirmed the occurrence of *moreletii* in the upper, fresh, tributaries of this system and we remain doubtful

of the true locality for these two specimens. -- Gonzalo Perez-Higareda, *Estacion de Biologia Tropical "Los Tuxtlas"*, Inst. Biol. Universidad Nacional Autonoma de Mexico, Aptdo. Postal 51, Catemaco, Veracruz, Mexico.

EUROPE

Germany:

CITES PROPOSAL. The German Scientific Authority is preparing a resolution for the 8th CITES conference in Kyoto next year. The proposal tightens restrictions for the trade in Appendix I species of crocodilians under the Farming and ranching provisions of the Convention. The draft resolution proposes that farming and ranching of appendix I species be prohibited except under special circumstances. Captive breeding operations that have acquired their stock by depleting natural populations should not qualify to register with CITES or trade their products and parties receiving approval for ranching and export quotas must not introduce new harvesting methods not approved. For example a party receiving approval for trade in ranched products should not then institute a major cropping program to provide skins for trade. Cropping should be restricted to problem animals and hunting trophies. This proposal will be discussed by the CITES Animals Committee at their meeting in Canada in August and the Steering Committee of the CSG will review and comment also. -- D. Jelden, *Bundesamt fur Ernährung und Forstwirtschaft*, 6000 Frankfurt a. M., 1. Postfach 180203, Germany.

Switzerland:

SWISS IMPORTS 1990. The following imports into Switzerland were reported in 1990. *Alligator mississippiensis*, 7,210 skins and 20 scraps and pieces, originating in USA, entering from France, Italy, and USA. *Caiman crocodilus crocodilus*, 40,262 sides, 1,192 skins and 5,550.1 sq m sides and skins originating from Venezuela, Colombia, Guyana, Bolivia and entering from Italy, France and UK. *C. c. fuscus*, 9,117 sides, 44 skins, 493.8 sq. m sides and 1,823 pieces originating in Colombia, Guatemala, El Salvador, & Panama and entering through Italy, Spain, France, and Colombia. *C. c. yacare*, 4,415 sides from Bolivia

and Paraguay entering from Italy. *Crocodylus niloticus*, 395 skins originating from Zimbabwe, Botswana and Sudan entering through France, Italy, Botswana and South Africa. *C. novaeguineae* 1,444 skins and 24 m of skins originating from Indonesia, Papua New Guinea and entering from France and Italy. *C. porosus*, 750 skins originating from Indonesia and Papua New Guinea entering from France and Italy. -- P. Dollinger, Swiss Federal Veterinary Office, CH-3097, Liebefeld, Berne, Switzerland.

SOUTH AMERICA

Argentina:

EL BAGUAL. The El Bagual caiman breeding program produced the first four nests in their breeding pens, one from a broad-nosed caiman (*C. latirostris*) and three from yacare (*C. yacare*). The *latirostris* nested late in November and her eggs were collected in mid-January and transferred to an incubator. The first egg pipped at 5.30 am on Sunday 17 February (giving us no rest time!) and as no further pipping occurred in the next 24 hours all the eggs were opened. All 37 eggs hatched alive although two died, one of which was clearly defective. By 10 March, 34 hatchlings were surviving. The hatchlings were maintained at 27° C and began to feed 4 days after hatching and defecating one day later. From an initial size of 22.23 cm length and 41.57 g weight they grew at a rate of 0.14 mm/day, 0.4 g/day for this short period, with a food conversion ration of 17%.



Hatchling *Caiman latirostris* emerging from the egg, January 1991, A. Yanovsky photo.

The three clutches of *yacare* eggs were brought immediately to the incubator after

laying. Clutch sizes were 34, 35, and 36 eggs and the eggs ranged from 68 - 75 g weight; 4.13 - 4.29 cm wide and 6.8 cm long. They are expected to hatch from mid-March to April. From experience at the Rockerfeller refuge I can state that females of both *latirostris* and *yacare* are less aggressive than alligators when one collects eggs but in contrast the hatchlings are more aggressive than alligator hatchlings. I have recently published a detailed review of *Caiman latirostris* and reprints may be requested from the author. -- A. Yanovsky, El Bagual Ecological Reserve, Salta 994 (3600) Formosa, Argentina.

Brazil:

SOCIAL FISHING BEHAVIOR IN PARAGUAYAN CAIMAN. The Paraguayan Caiman, *Caiman crocodilus yacare*, is the most social species observed in Brazil. Many social interactions occur in shallow open ponds during the dry season when very large concentrations of this species congregate in the limited habitat. Among these are social fishing behavior shown in the photograph [see front cover]. Similar behavior has been reported in the Nile crocodile (Pooley and Gans 1976) but this is the first report and documentation of this behavior in *C. c. yacare*. -- Carlos Yamashita, Rua Voluntarios da Patria 4130/ 52A, 02402, Sao Paulo, SP. Brazil.

BROAD SNOUTED CAIMAN IN BRAZIL. Fifteen broad snouted Caiman were born at CIZBAS/University of Sao Paulo, Piracicaba, Brazil last March. In the five other breeding institutions in Brazil only one other nest that hatched only 2 eggs was reported. This is a dangerously small number considering that there are only 279 captive *C. latirostris* reported in the last census of the Brazilian Society of Zoos and most of them are unhealthy or have sub-clinical sterility. Collection and incubation of eggs from the wild may be needed to increase the captive breeding colony.

Well planned and biologically sound farming projects can obtain the necessary licence from IBAMA, the Brazilian Department. As of last March there were 26 farming operations for *C. latirostris* in Sao Paulo State and the number is increasing.

In spite of colonizing some degraded habitats, the perspective of the remaining wild populations in Sao Paulo State are pessimistic. Their main remaining habitat, Porto Primavera, a 1500 km² marsh of the Paraña River, will be destroyed by the construction of a hydroelectric station. Despite the resolution passed by the first Workshop on Conservation and Management of the Broad-Snouted Caiman in October 1990, development of the project is proceeding without real care or planning for the caiman. The second Workshop will take place in Piracicaba, Brazil, next October 7 - 8, and papers will be presented by Peter Crawshaw, Alejandro Larriera, Luciano Verdade, Maria Theresa Mello and others. The Regional Studbook and a Population Viability Analysis of the captive colony in Brazil will be presented and the papers published in a Proceedings of the meeting. -- Luciano Martins Verdade, CIZBAS/ESQALQ/USP, Caixa Postal 09, 13.400, Piracicaba, SP, Brazil.

Colombia:

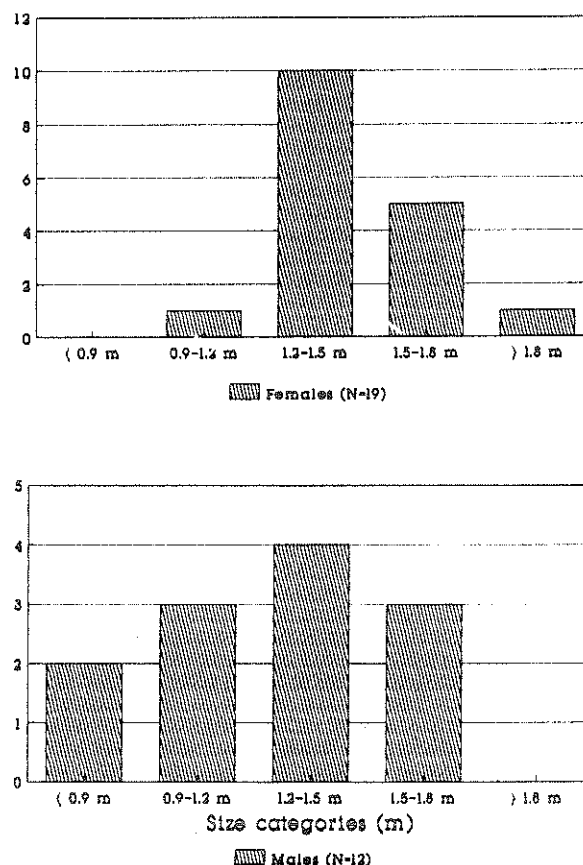
NEW FARMING PROJECT IN COLOMBIA. A new farm has been established at Rotinet (Atlantico) for ranching caiman (*Caiman c. fuscus*) and Iguana, funded primarily by Promatlantico, and Acopi, two investment and industrial associations. The project has received approval byINDERENA (Wildlife Office) and plans to have 1300 breeding caiman and 1000 breeding iguanas, that will initially be collected from the wild. The farm has an objective of producing 16,000 salted caiman skins and up 12,000 iguanas for the pet trade for export by 1996. Investment in this project is budgeted at 286 million pesos for 1990 (approximately \$0.5 million US). Zooagro, a consulting firm from Medellin has been in charge of preparing feasibility studies and managing costs of the project. -- C. Herrera, Calle 72, #41-8-28, Barranquilla, Colombia.

ORINOCO CROCODILES BORN IN COLOMBIA. After 20 years of effort the Estacion de Biologica Tropical Roberto Franco has succeeded in hatching eggs from a captive *Crocodylus intermedius*. A pair of Orinoco crocodiles was acquired by Dr. Federico Medem in 1976 shortly after the establishment of the Station. The male (1.83 m) and female (1.16 m) grew to maturity at the station and the first evidence of mating and oviposition was seen in 1986. For the following

several years the female laid eggs but none of these hatched due to a variety of circumstances. Early clutches were laid in the water and later clutches were infertile, suffered early embryonic death or failed to develop in the incubation medium provided. After 1989 special efforts were made to improve nutrition and develop an incubator with properly controlled temperature and humidity and these efforts were crowned with success in March 1991 when 7 live hatchlings emerged from a clutch of 16 laid the previous December. Success after 20 years of effort in this project. -- Adapted from a report by Jaime Ramirez, Director Cientifico, Estacion de Biologia Tropical Roberto Franco, Villavicencio, Colombia.

Venezuela:

CONSERVATION OF VENEZUELAN CROCODILES. In April 1990, 31 Orinoco crocodiles were released into the wild at El Frio Ranch, close to the wildlife refuge Caño Guaritico.



(Animals reared at El Frio and UNELLEZ)

Figure 1. Size distributions of crocodiles released at El Frio.

Sixteen of these crocodiles were raised at Masaguaral Ranch and the others at UNELLEZ facilities in Guanare. The crocodiles were not released directly into the refuge because the management plan and wardens are not yet in place to ensure some protection for these animals. In March 1991 another 28 crocodiles were released at El Frio. Twelve from Masaguaral, 6 from UNELLEZ and 8 raised at rearing facilities at El Frio. Therefore a total of 55 *C. intermedius* have been released in the last year. This number is not completely satisfactory. The combined rearing facilities available in Venezuela could raise between 100 and 200 crocodiles a year and only need some small improvements to increase their production. The size distribution of the 29 released crocodiles originating at El Frio and UNELLEZ facilities are shown in figure 1. Twenty of these were captured as hatchlings from the Cojedes river, one of the few extant populations in Venezuela; 12 were from the breeding pair at UNELLEZ and 1 from the Tucupido river. The size distribution of the animals raised at Masaguaral is similar to that shown in the figure.-- Andres Eloy Seijas, UNELLEZ, Mesa de Cavaca, Guanare, Portuguesa, Venezuela.

FUDENA CROCODILE CONSERVATION. The FUDENA crocodile group met in late February to plan crocodile releases for the year. A group of *C. intermedius* was released in the Caño Guarito Reserve in March (article above). Unfortunately there has been no follow up on the animals released last year. We did a brief survey in March and Jose Ayarzagüena and I will arrange a small radio telemetry study. In the next few weeks we will be releasing 10 juvenile crocodiles in the Capanaparo river and Maria Muñoz, a Venezuelan student, will be conducting a year long telemetry study of released and captive crocs. In January, 280 eggs were collected in the Capanaparo for incubation and rearing at Hato Masaguaral for later release. We are paying local Indians to locate eggs and selling them chicken eggs at a bargain rate to try and offset Indian consumption of croc eggs, which is a big problem on the Capanaparo.

On Masaguaral we have built a new incubation shed and improved the water system supplying the juvenile croc pens. We produced 8 *C. intermedius* nests this year but only 3 are fertile. It appears the females are setting up a

dominance hierarchy in our cramped breeding pens and only dominant females are mating with the males. We are constructing a new breeding pen to hopefully alleviate this situation. The pair of *C. acutus* at Masaguaral have bred every year and we have better success at raising *acutus* than the more aggressive *intermedius*. The first group of about 55 animals are set to be released this year on Tacarigua reservoir in Falcon State. -- J. Thorbjarnarson, c/o FUDENA, Apartado 70376, Caracas, 1071-A, Venezuela.

VENEZUELA TRADE. Venezuelan crusted caiman hides were selling at between US \$40.00 and \$49.50 per square foot in September 1990. By March 1991 the price had fallen to US \$32.00 per square foot and only three of the six tanneries were buying skins from the 1991 wild harvest. Many ranchers are apparently holding back from selling as the average price for a pair of salted flanks has dropped to about \$55.00, down from \$105.00 in 1989. (The average yield of crusted leather from caiman flanks is about 3.1 square feet). -- S. Gorzula, 14 Ferry Road, Millport, Isle of Cumbrae, KA28 0DZ, Scotland, U.K.

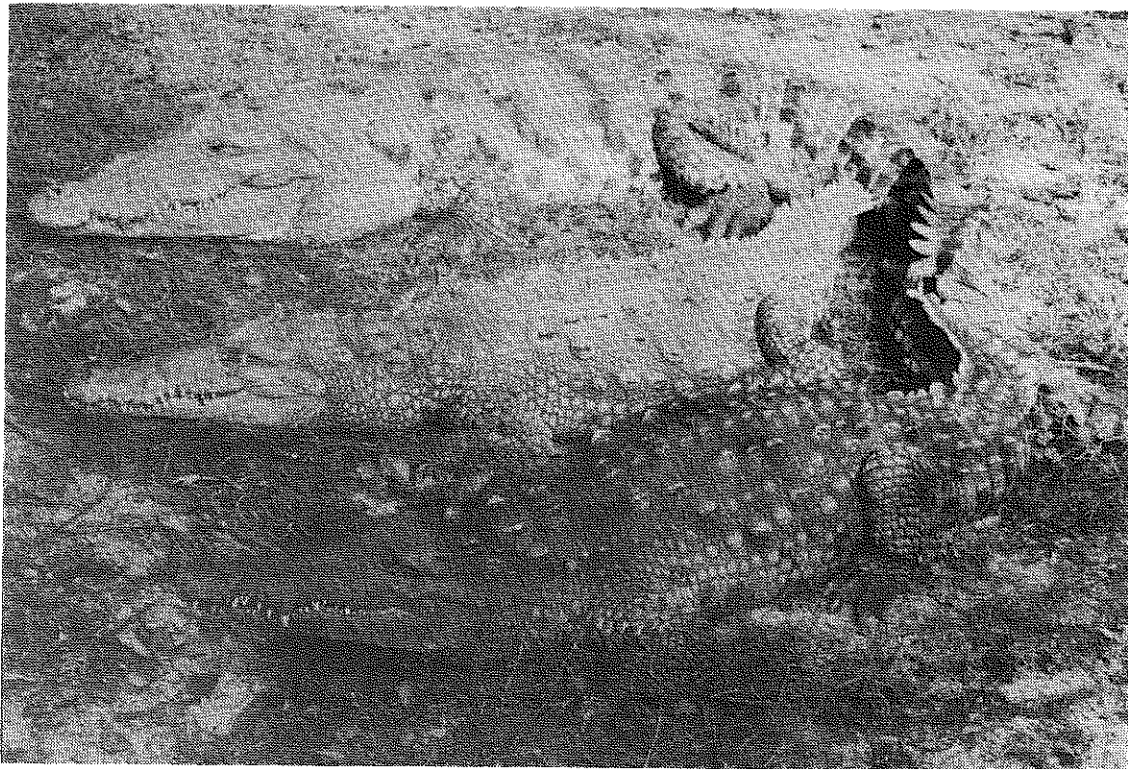
Suriname:

FEASIBILITY STUDIES FOR COMMERCIAL CAIMAN USE. In late 1990 the Anton de Kom University of Suriname started a project to examine all the population dynamic parameters of a *Caiman crocodilus* population on the coastal plain. These data will be used to simulate the influence of different management and exploitation methods and regimes on the population and on the yield. The project team consists of aquaculturalist Jan Mol and Paul Ouboter. In June Geert Peters, an ecologist, will join the team to conduct field work. -- Paul E. Ouboter, Dept. of Zoology, Anton de Kom University of Suriname, P.O. Box 9212, Paramaribo, Suriname.

NORTH AMERICA

United States:

ACUTUS BREEDING AT GATOR JUNGLE. In June 1990 Tracy Howell of Gator Jungle and I, introduced three *Crocodylus acutus* at Gator



C. acutus breeding group at Gator Jungle, male (top) and two females.

Jungle's new crocodile breeding center, Dover, Florida.

The male was 13.5 feet and weighed 720 lbs and was raised at the Miami Serpenterium since 1950. The females are 8.5 and 9.0 feet and weigh 211 lbs and 246 lbs. They have also been in captivity in zoos and exhibits in Florida for many years. As far as we know they had never been held with potential mates. Copulation was observed the day after introduction and has been seen frequently throughout the past year. The larger female laid 38 eggs in early April and several eggs recovered that were laid by the smaller female in early May. Unfortunately none of the eggs showed any signs of being fertile, or perhaps had suffered early embryonic death. We hope these very important mature crocodiles will reproduce successfully in the future. -- B. M. Shwedick, *Crocodile Conservation Services, Reptile World Inc., P.O. Box 1099, Bowie, MD 20715, USA.*

CROCODILE BREEDING PROJECT AT SILVER SPRINGS, FLORIDA. For the past several years we have been providing mates on breeding loan to the unpaired crocodilians that have been part of the beautiful and natural exhibits at Silver Springs. Several months ago one of our large

male Malayan gharials (*Tomistoma schlegelii*) was introduced to their large adult female. Both animals are about ten feet in length. We started by pulling the divider between their large adjoining enclosures. When the male began spending more and more time in the females enclosure, the divider was partially replaced to allow escape in the event of over aggression. Initially the female displayed dominance over the male, particularly in the basking areas. Since then the male has become more confident around her is no longer being submissive to her aggressive displays. Norman Bertrand and the staff of Silver Springs reptile dept. have been recording observations with pen and video recorder.

We have also successfully introduced three Dwarf crocodiles (*Osteolaemus tetraspis*), one male and two females. This group of adults are some of the only *Osteolaemus* in captivity that have some original locality data. They were imported in the early 1970's from Cameroon. These and other crocodilians are on exhibit at Silver Springs and are part of the interpretative lectures provided to the public by their staff. -- B.M. Shwedick, *Crocodile Conservation Services, Reptile World Inc., P.O. Box 1099, Bowie, MD 20715, USA.*

GOLD KIST ALLIGATOR FOOD. Gold Kist entered the alligator food market in 1990. Gold Kist Alligator Grower is a 46% protein, 10% fat product and is dry and extruded much like extruded dog food. In the extrusion process ingredients are cooked to improve digestion and nutrient availability. On the basis of pound of food dry matter or pound of protein dry matter, the extruded formula is considerably more economical than meat by-products or meat refuse.

Some farmers feed Gold Kist as a supplement to their regular diets of meat products, and others are experimenting with feeding a straight diet of GK Alligator Grower with no meat. The dry food can be poured directly onto the feeding platform, or it can be poured on the water as it floats for some time. Floating food gives more timid alligators equal access to food, reducing competitiveness during feeding. Alligators fed a diet of part or all dry food grow faster and more uniformly than animals grown in the wild. -- E.L. Nichols, *Nutritionist, Gold Kist Inc., P.O. Box 2210, Atlanta, GA 30301, USA.*

SO YOU WANT TO BE AN ALLIGATOR FARMER? The American Alligator Farmers Association (AAFA) prepared the following answers to some frequently asked questions. While these responses are in some ways specific to the situation of rather small scale commercial farming in Florida, we reprint them in edited form here as a general guide to important aspects that prospective crocodilian farmers anywhere must face.

- How much does it cost to enter this business? As Mr. Vanderbilt said, "If you have to ask, you probably can't afford it." An extremely conservative figure based on 1990 prices in Florida, USA, for a farm holding 1000 alligators, is \$100,000 for the initial facility and stock and sufficient cash reserve to operate for the first three years.

- Can I begin with a smaller operation at lower cost and build up later? Many fixed costs such as license fees, physical plant and other equipment cost the same, no matter how few alligators you hold. Other costs like feed fuel and antibiotics are cheaper per unit if you purchase more. Economies of scale can be realized with a greater number of animals.

- How much land do I need? As a minimum about 5 acres (2 hectares) for a stock of 1000 alligators is needed. Depending on drainage and layout, 10 acres (4 hectares) would be better. Many localities now control disposal of contaminated waste water.

- Where do I get my stock? In Florida 30 lucky farmers are registered to receive wild eggs and hatchlings but available quantities are usually insufficient to stock a farm. Additional stock can be purchased from other farmers, and brokers in and out of State. [Worldwide the acquisition of stock for farms has to be acquired without detriment to wild populations and local management authorities regulate this -- Eds.]

- How much should I pay for an alligator? In Florida the State authority charges US \$15 per hatchling and \$5 per egg taken from the wild as a tax to support alligator management. To this must be added actual collection costs of fuel, transport, labor, etc. Hatchlings have been selling for \$35 to \$50 each from farms.

- How much does it cost to raise an alligator to market size? Actual costs depend a great deal on the size and organization of your operation. Unpredictable events like disease, and poor husbandry leading to slow growth can greatly increase costs/decrease yields. A recent survey of AAFA producers indicated 1990 costs of between \$183 and \$273 to raise an alligator in Florida to the 6 foot plus length that produces the 36 - 46 cm width belly skin that commands the better prices.

- How long does it take to raise an alligator to marketable size? Under ideal conditions the fastest growers reach marketable size in about 18 months. After 22 months nearly all of a year's crop can be harvested.

- What constitutes ideal growing conditions? Water temperature should be maintained (usually by artificial heating) at 89° F. (31.7° C) Correct nutritional balance, sufficient high quality food, good sanitation and avoidance of stress all improve alligator growth. A large amount of technical information on layout of pens, veterinary care, stocking rates etc. is available and should be consulted before starting up.

- How much can I make? In 1990, before the decline in skin prices, the smallest marketable alligator produced a 30 - 34 cm width skin and about 8 lbs of meat and would yield about \$320. Today that small alligator cannot be sold. A

larger alligator yielding 35 cm - 40 cm width skin may sell for \$180 - \$250.

■ Couldn't I raise larger alligators and make more money? Alligators grow much more slowly after they reach about 4 feet length. It takes almost as much in costs to raise an alligator from 5 feet to 6 feet as it cost to raise him to 5 feet.

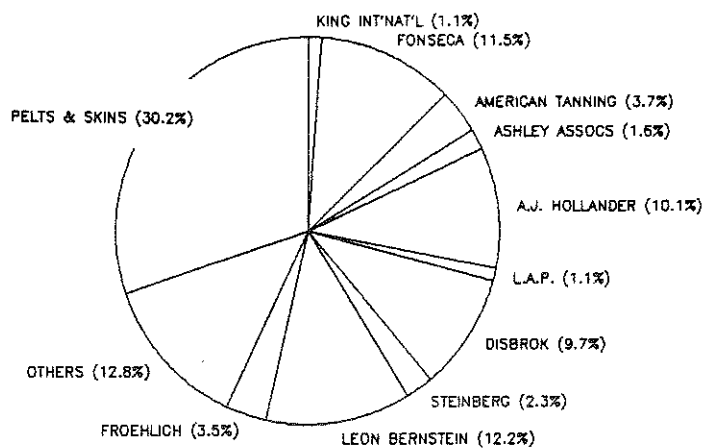
■ Couldn't I breed my own stock? Yes there are two kinds of operations. Farms include production of stock from captive breeding; ranches grow out hatchlings obtained from other sources. Many Florida farms combine the two. A prime young adult female alligator may produce 17 -25 live eggs in two out of every three years. Ratios of 3 - 5 females for every male seem ideal and much study is being done on improving fertility by reducing stress and crowding and improving nutrition. Breeding stock may need a couple of years to settle down and begin production. Issues of maintaining genetic diversity, selecting favorable strains and removing worn out old females are recognized but still not properly solved. [To produce 1000 live hatchlings a year will take a stock of between 115 and 200 adults, which must be fed and housed all year long -- *Eds.*]

■ Where can I get assistance with information and marketing? The American Alligator Farmers Association provides information and cooperative marketing for members. -- D. Morgan GATORTALK, May 1991. P.O. Drawer 1208, Keystone Heights, FL 32656, USA.

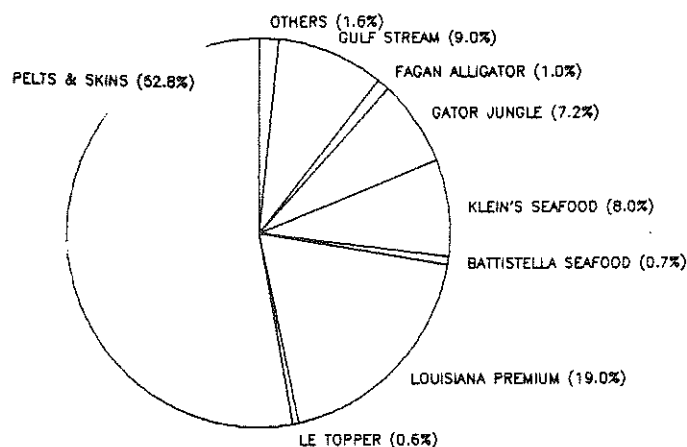
U.S. EXPORT DATA. The following graphs have been extrapolated from the export statistics provided by US Fish & Wildlife Service, Division of Law Enforcement, on 23 May 1991. They indicate exports of meat and skin from the USA by trader. Companies and individuals operating under more than one trade name are reported under only one (usually the most recognizable) of their trade names. Some difficulties were experienced analyzing these data because of the difficulty of receiving accurate information and discrepancies in the numbers received. For example meat exports are often reported as "items" although trade is conducted in kilograms or pounds. Therefore all designation of "items" were converted to kilograms. Figures of skins exported in 1990 show a discrepancy of several thousand skins between Federal export figures and State of Louisiana numbers. No attempt was made to correct these discrepancies and the

figures shown are as received from US Fish & Wildlife Service.

SKIN EXPORTS BY COMPANY 1989-1990
(TOTAL EXPORTED: 168,329 SKINS)



MEAT EXPORTS BY COMPANY 1989-1990
(TOTAL EXPORTED: 475,281 KGS)



-- Z. Casey & T. Elman, *Pelts and Skins Export Ltd.*, 106 Park Place, Suite. 303, Covington, LA 70433, USA.

ALLIGATOR FREEZE IN TEXAS. As every Southerner knows the early part of winter 1989-90 was severe and record low temperatures were seen around Christmas. Mike Krueger, biologist

with Texas Parks and Wildlife (TPW) provided some information gathered by TPW on the effects of the freeze. In Matagorda County 7 alligators were found dead and 5 of these were over 10 feet in length. On the Murphee Wildlife Management Area in Jefferson Co., 40 were found dead. The size classes were: 1' - 4' = 29, 5' - 7' = 10, and 8' + = 1. Both of these areas, Matagorda Co. and Jefferson Co., are coastal and consist primarily of coastal marsh with shallow water. There were no reports of alligator deaths in inland areas where the habitats are lakes, ponds and rivers where the water is deeper. Perry Little at Sam Houston State University reported that he lost nearly all the alligators he was using for nutrition research at this time when they were moved from indoor facilities to an outdoor pond. Not enough data are available to make conclusive statements, but these examples suggest that alligators, captive or wild, living in shallow water areas are vulnerable to this kind of temperature extreme. [Temperatures remained below 0° C for several days during the most extreme episodes of this event. --Eds.] -- Gordon B. Henley, *Ellen Trout Zoo, P.O. Drawer 190, Lufkin, TX 75902-0190, USA.*

COLD BLOODED RESEARCH. The Scientists Center for Animal Welfare and Louisiana State University School of Veterinary Medicine sponsored the first International Conference on Care and Use of Amphibians, Reptiles and Fish in New Orleans on 8 -9 April 1991. The first day's discussion on reptiles and amphibians covered animal use regulations, housing, nutrition, medicine, anesthesia, and field and laboratory techniques. Roland Coulson summarized forty years of experience with alligators. He reported that the alligator's inability to utilize raw plant material is due the absence of the enzyme sucrase which is required to hydrolyze plant sucrose into useable blood glucose. Val Lance discussed the effects of stress and pain on serum chemistry values. Testosterone, estrogen and progesterone are greatly reduced in alligators stressed during the blood collection process and this factor must be considered when evaluating blood data. Dorcas Schaefer reviewed reptilian diseases in captivity. The limited information on crocodilians indicates bacterial pathogens resulting from improper hygiene, nutrition and crowding were most

commonly encountered and therapeutic treatment with aminoglycoside antibiotics were discussed. -- Terry G. Heaton-Jones & D.L. Heaton-Jones, *College of Veterinary Medicine, University of Florida, Gainesville, FL 32611, USA.*

WEST ASIA

India:

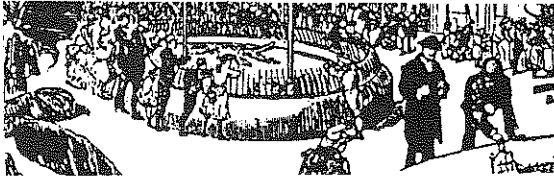
CROCODILE RESEARCH AND MANAGEMENT IN ORISSA. The saltwater crocodile, *Crocodylus porosus*, conservation program has been operated very successfully in Bhitarkanika Wildlife Sanctuary for over a decade and a half. A total of 1072 young *C. porosus* above 1.0 m length have been released into the Sanctuary in locations away from human habitation. The movements, survival and growth of the released crocodiles have been monitored. A few of the crocodiles released in 1977 and 1978 have already laid eggs in the wild indicating the success of this program.

At present 486 crocodiles of 1 year to 16 years age are being reared at the Research Center. There is a proposal to release 200 young crocodiles from Bhitarkanika (above 1.5 m length) in the Sundarban area in west Bengal. The Sundarban is the largest area of mangroves in the country and is one of the largest remaining *C. porosus* habitats, but only a few crocodiles remain. A rearing and rehabilitation center is in operation in Sundaraban but so far they have released about 200 crocodiles. In Bhitarkanika the collection of eggs and rearing of *C. porosus* has continued on a reduced scale as additional releases into the Sanctuary have become a problem due to conflict between crocodiles and people. This year only 220 eggs were collected from five nests and more than 15 nests were left in the wild.

At Nandanakanan Zoological Park captive breeding of all three Indian species of crocodilian has been successful. Five of six female gharials have laid eggs, producing a total of 220 eggs between 12 and 24 March. On 25 April 106 eggs were moved to an incubator and the remainder were left in the nests. In the Mugger (*C. palustris*) pool one of the two females laid 10 eggs in April but only three hatchlings emerged. Holdings at Nandanakanan are now 177 gharials (1.6.170), six Muggers, five saltwater crocodiles. Two hundred and ten gharial and 50 muggers

raised at Nandanakanan have been released into the Satkosha Gorge of the river Mohanadi, one of the best gharial habitats in India. -- S.K. Kar, *Research Officer, Wildlife Wing, Forest Dept., 315 Kharaval Nagar, Bhubaneswar, 751001, Orissa, India.*

ZOOS



SIAMESE CROCODILES AT ELLEN TROUT ZOO. Our new exhibit is nearing completion, the pool is being installed and, except for the plantings and the croc move, this will finish the display. One pair of adults will be housed in the exhibit area, complete with artificial rock ledges, a waterfall and lush tropical plants. Two off-exhibit pools will provide areas for another adult pair and any young produced.

We have had Siamese crocodiles here for fifteen years and have observed copulation, or attempts, every year. However, eggs were produced only once and they were infertile. In an effort to be more productive with these animals we decided to construct the indoor enclosures. I know this will improve our exhibit and hope it will be a benefit reproductively. -- Gordon B. Henley, *Director, Ellen Trout Zoo, P.O. Drawer 190, Lufkin, TX 75902-0190, USA.*

STATUS OF *C. SIAMENSIS* IN THE USA. The North American Regional Studbook of the Siamese crocodile, prepared by Mark Wise, was published in February 1991. The wild population of *C. siamensis*, with a historical range of central Thailand and the Malayan peninsular, extending into Cambodia and Vietnam, has been under extreme pressure from hunting and habitat destruction. The species is thought to have declined to the brink of extinction. During 1970 and 1971 there were 36 Siamese crocodiles imported into the USA. Previous imports of unknown origin occurred in the 60's. There are currently 17 males, 25 females and 104 animals of unknown gender held at 14 locations in the United States. The studbook details origins and relatedness of this stock. -- Mark Wise, *St.*

Augustine Alligator Farm, P.O. Drawer E, St. Augustine, FL 32804, USA.

COMMENTS ON STATUS OF *C. SIAMENSIS*. The following comments are extracted from a letter from Rick Hudson to Mark Wise:

"Congratulations (on the regional studbook), it represents a lot of work...It also reveals some glaring problems...

1. The (US) population is descended from 6.6 founder animals but one pair has contributed over half of the captive bred progeny.
2. Of the wild caught *siamensis* imported in the 70's, 13 are dead, only one of which bred prior to death...There are ten wild caughts from those early importations that are still alive and have never reproduced. Is any effort being made to assure that their genetic potential is being realized?

The North American captive population may bear the responsibility for the long term survival of this species (and) some remedial measures may be in order to broaden the genetic base and founder contribution. We should make every effort to ensure that the wild caughts are monitored closely and placed in the optimal breeding situations. The genetic potential is out there, it just needs a little tighter management. *C. siamensis* is a likely candidate for some basic SSP-type genetic management. The current population of 17.25.104 in 14 institutions is certainly adequate to sustain the species."

-- Rick Hudson, *Fort Worth Zoo, 2727 Zoo Park Drive, Fort Worth, TX 76110, USA.*

TOMISTOMA NEST IN SOUTH CAROLINA. On 29 May 1990 a female *Tomistoma schlegelii* of approximately 3 m length laid a clutch of 26 eggs. Nest construction began on 24 May and took place only at night. Nesting material consisted of wood mulch placed in the exhibit for that purpose as well as leaves and other plant material that had fallen into the exhibit. The nest was approximately 0.75 m x 1.5 m. The female became very protective of the nest and would advance toward anyone entering the exhibit. Eventually she became aggressive toward the male and he had to be isolated in an adjoining area. All the eggs were removed for

artificial incubation and unfortunately proved to be infertile.

This pair was re-introduced in September of 1990. As of 13 March 1991, courting behavior by the male has been observed and the female has begun nocturnal visits to the previous year's nest site where she has started scraping nesting material into a mound. These animals are exposed to the natural photoperiod of South Carolina, USA. -- Scott Pfaff, *Riverbanks Zoological Park, P.O. Box 1060, Colombia, SC 29202, USA.*

TRADE



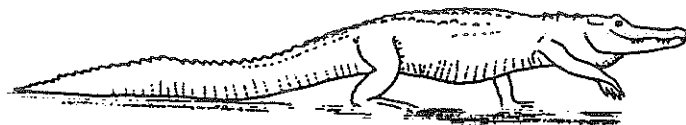
The following prices in US dollars were reported to the editors. The CSG cannot guarantee the accuracy of these reports and makes no endorsement or advertisement of sales or prices.

Crocodylus niloticus in South Africa: April 1991, belly skins 35 cm - 40 cm width = \$5.50 per cm width. Live hatchlings, 6 months old = \$40.00 each

Caiman crocodilus in Venezuela: March 1991, salted flanks = \$55.00 per pair, crusted hide = \$32.00 per square foot.

Crocodylus porosus in Papua New Guinea: June 1991, salted belly skins 18 - 20 cm width = \$4.50 per cm width, 21 - 25 cm width = \$5.00 per cm width, 26 - 40 cm width = \$6.50 per cm width, 41 - 51 cm width = \$8.50 per cm width.

Crocodylus novaeguineae in Papua New Guinea: June 1991, salted belly skins 18 - 20 cm width = \$2.00 per cm width, 21 - 25 cm width = \$4.00 per cm width, 26 - 40 cm width = \$5.50 per cm width, 41 - 51 cm width = \$7.20 per cm width.



ESTIMATES OF CROCODILE SKIN PRODUCTION 1989. Estimates of legal production of crocodile skins. Corrections and reports of other production are invited by the author.

	Wild	Captive Ranch Bred
<i>Alligator mississippiensis</i>		
Israel	0	0 430
USA	32,986	*66,502
<i>Caiman crocodilus</i>		
Colombia	0	0 16,000
Guyana	7,000	
Honduras	6,000	
Venezuela	137,274	
<i>Crocodylus cataphractus</i>		
Congo	600	
<i>Crocodylus johnsoni</i>		
Australia	0	923
<i>Crocodylus niloticus</i>		
Botswana	2,000	
Cameroon	0	
Congo	150	
Israel	0	0 ?
Kenya	1,000	1,650
Madagascar	1,000	
Malawi	700	1,600
Mozambique	1,000	
South Africa	0	0 4,569
Sudan	5,000	
Tanzania	2,000	
Zambia	0	6,200
Zimbabwe	0	*11,552
<i>Crocodylus novaeguineae</i>		
Indonesia	12,608	2,255
P N G	14,415	7,684
Singapore	0	0 601
<i>Crocodylus porosus</i>		
Australia	0	1,402 569
Indonesia	2,297	470
Malaysia	0	0 295
P N G	3,857	3,065
Singapore	0	0 2,263
Thailand	0	0 250
<i>Crocodylus rhombifer</i>		
Cuba	0	0 1,000

Crocodylus siamensis (including hybrids)
Thailand 0 0 2,650

Osteolaemus tetraspis
Congo 0

* Includes some skins from captive bred animals

-- Richard Luxmoore, *Wildlife Trade Monitoring Unit, WCMC, 219c Huntingdon Rd., Cambridge, CB3 0DL, UK.*

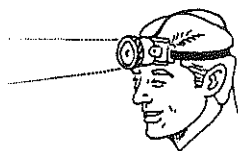
PUBLICATIONS



EGG INCUBATION: Its effects on Embryonic Development in Birds and Reptiles. 1991. Edited by D. C. Deeming and M. W. J. Ferguson, Cambridge University Press, 246x189 mm, c. 500 pp. ISBN 0 521 39071 0, Hardback £85.00 This book comprehensively reviews incubation effects on the embryonic development in birds and reptiles and presents the first synthesis of data from these two vertebrate classes. The book is in three parts. Part 1. - Egg structure, shape and function; Part 2 - Incubation; Part 3 - Early embryonic development. Publication date August 1991.

Deeming D. C. & M. W. J. Ferguson 1991. Reduction in eggshell conductance to respiratory gases has no effect on sex determination in *Alligator mississippiensis*. *COPIEA* 1991(1):240-243.

PERSONALS



Juan Carlos
Troiano, V.M.
Casilla de
Correos 22,
Sucursal 25 "B"

- 1425, Buenos Aires, Argentina writes:

For two years I have been working in a private project to breed *Caiman latirostris* in captivity, located in Entre Rios Province about 200 km from Buenos

Aires. With the collaboration of the Veterinary School I have worked in 1990 and 1991 on hematological values in *C. latirostris* and I am looking for an opportunity to develop this work with another institution. Please notify me at my address.

BIRTHS. Josef Burton Gorzula was born 6 March 1991 to proud parents Stephan and Josie. We offer our best wishes to our new colleague and his parents.

Fabio Rueda, Zoorecol, P.O. Box 9104, Cartagena, Colombia, writes:

In our *Caiman crocodilus fuscus* crocodile farm we are experimenting with different diets based on tilapia production that we have started on our farm because of the increase in prices of fish scraps. This rise in fish scrap prices is due to the many crocodile farms in our area.

Mark Staton, Mainland Holdings Pty. Ltd., P.O. Box 196, Lae, Papua New Guinea, has been promoted to crocodile division general manager. Greg Mitchell has started his own business and will be supplying Mainland Holdings with live purchased crocodiles on contract as well as dealing in skins and other items. The Mainland Holdings farm is doing very well with growth rates, skin quality and mortality are dramatically improved over the last 18 months and we expect a good 1991.

Matt Plutz, Dept. of Zoology & Physiology, University of Wyoming, P.O. Box 3166, Laramie, WY 82071-3166, USA, will be conducting research on the control of reproductive system development using the American alligator as a model. I hope to determine if Follicle Stimulating Hormone has a role in the control of the Mullerian duct regressor during embryogenesis.

Dr. Goran E. D. Blomberg, 304 Milford Street, East Lansing, MI 48823, USA, officially became Dr. Blomberg on 31 August 1990 and is now investing huge sums and effort in search of a

position in wildlife research. He was interested to learn from CSG NEWSLETTER 9(4) of our crocodile man in Sundbyberg, Sweden, journalist Tony Hakansson. Being familiar with Sundbyberg and environs Goran would like to pass the following message to Tony: "Hälsningar! Kanske vi träffas nästa gång jag besöker Sverige!" [To facilitate review and protect the CSG and the editors from prosecution for libel, would persons submitting items not in Spanish, English, French, Arabic or Iban, please provide a translation.--Eds.]

C. Kenneth Dodd, Jr., USFWS, National Ecology Research Center, 412 N.E. 16th Ave., Rm. 250, Gainesville, FL 32601, USA, successfully co-organized a symposium entitled "Conservation of Biodiversity: Fishes, Amphibians, and Reptiles." The symposium was held in conjunction with the annual meeting of the American Society of Ichthyologists and Herpetologists in New York City in June. He was also recently elected an Adjunct Associate Professor in the Department of Wildlife and Range Sciences at the University of Florida.

Professor Gordon Grigg, Dept. of Zoology, The University of Queensland, Old. 4072, Australia, with his colleague, Lyn Beard, will be joined by Professor Rufus Wells from the University of Auckland, New Zealand, for a second year to carry out work on the physiology and biochemistry of embryonic hemoglobins in *Crocodylus porosus*. He is organizing a workshop on "wildlife harvesting for conservation" in October and notes that the IUCN resolution on sustainable use refers to "some" wildlife. He thought it would be useful for the workshop to address parameters that might define which species might be suitable for sustainable use.

I. Lehr Brisbin, Savannah River Ecology Lab, P.O. Drawer E., Aiken, SC 29802, USA, has agreed to serve as section editor for crocodilians of the Catalog of American Amphibians and Reptiles and invites suggestions for the completion of the series. His famous cohort of alligators that have been raised for four years on dry chow continue to grow and prosper.

Victor Onions, Edward River Crocodile Farm, P.O. Box 669, Cairns, Qld 4870, Australia, informs us that they have moved on site to a new locality at Redbank just 20km south of Cairns where they are developing their crocodile raising and visitor facility. Over 3000 *C. porosus* bred at Edward river are in place at Redbank and the first cull is planned for late June. Crocodile breeding, hatching and raising up to 9 - 12 months age will continue to operate at the Edward River location on the west coast of Cape York, Queensland, which is now known as Pormpuraaw.

REQUESTS



Bruce Shwedick of Crocodile Conservation Services Inc. requests any information and photographs of *Osteolaemus tetraspis osborni* in captivity or in the wild for an ongoing project with this subspecies. Please write to: -- Reptile World Inc., P.O. Box 1099, Bowie, MD 20715, USA.

SUBSPECIFIC TAXONOMY OF *CROCODYLUS NILOTICUS*. Help, I am trying to identify the subspecies of the extinct Israeli crocodile. I would like to hear from anyone who has tested the geographic validity of the various ssp. as summarized by Fuchs, Mertens and Wermuth 1974. -- Prof. Yehudah Werner, Dept. Zoology, Sturman Bldg., Hebrew University, 91904, Jerusalem, Israel.

CORRECTIONS

UGANDA CROC FILM. CSG NEWSLETTER October - December 1990, 9(4):7, referred to a film titled "Here be Dragons". It was difficult to track down because the title was changed to "Crocodiles Terror of the River" and later to "Crocodiles Here be Dragons", under which title it is available from the National Geographic

Video Club (Product code #51482). -- Alberto Aviles, P.O. Box 163013, Miami FL 33116, USA.

FLAXEDIL / NEOSTIGMINE WARNINGS. Ref. CSG NEWSLETTER 10(1):3. The article on transportation of live crocodiles is excellent practical advice and your warning on care using Flaxedil is appropriate. However, Flaxedil is NOT a narcotic. Unfortunately crocodilians do not respond well to narcotic immobilization. They can be anesthetized with Ketamine but this is expensive on large crocodiles and lacks an antidote so the effects cannot be quickly reversed. The most satisfactory immobilizing agent for crocodilians is Gallamine, marketed as Flaxedil. It is a neuromuscular block (a paralyzing agent) that is usually used in surgery as a muscle relaxant in conjunction with closed circuit respiratory anaesthesia and assistance. Its effects are countered by Neostigmine but this drug has powerful side effects that can be fatal. In mammals, atropine must be used prior to Neostigmine treatment. Crocodiles are unusual in that they tolerate Gallamine without needing respiratory assistance, and that its effects can be counteracted using Neostigmine without atropine. Any attempt to counteract Gallamine with Neostigmine without first using atropine in mammals (including humans) would result in a tragedy. While Gallamine functions as an immobilizing agent for crocodiles, it is not an anaesthetic. The crocodile is immobilized but its senses are fully functional. It can see, hear, smell and feel, it just cannot respond. Therefore noise, disturbance and other stress should be avoided and certainly no painful procedure should be initiated without some other suitable anaesthetic. -- E.V. Cock, 15 Knowetop Drive, Greendale, Zimbabwe.

SUSTAINABLE USE IN CANADA. It has come to our attention that the CSG Newsletter of October - December 1990 contained a statement to the effect that Canada was demonstrating organized opposition to sustainable use of wildlife.

This is not the case. The Canadian Customs advice referred to is an excerpt from an Environment Canada brochure on importation of animals restricted by CITES. The advice was quoted out of context and clearly refers only to

endangered species taken from the wild and for which CITES trade restrictions apply.

Canada recognizes the conservation benefits of managed sustainable use and is a strong advocate of sustainable use programs where the biological constraints so permit.

I trust that you will bring this to the attention of the Group and note the misquote in the next issue of the Newsletter. -- R. Campbell, Administrator for CITES, Canadian Wildlife Service, Ottawa, Ontario, K1A 0H3, Canada.

THE CHAIRMAN REPLIES. Dear Dr. Campbell: Thank you for your letter and enclosures. [After quoting from the NEWSLETTER 9(3):13. Prof. Messel continues]. I picked up the Canadian Customs brochure when I was home in Canada in September 1990 and was most surprised to read ... " Belts, coats hats, carvings, jewellery, wallets and handbags are only some of the items which can be fashioned from the skin, feathers and other parts of wild species. Generally you should avoid purchasing anything made of ivory, reptile skin (including that of alligators, crocodiles and the larger snakes), the skins of spotted cats and tortoiseshell."

To make matters worse the following boxed paragraph appears at the end of the brochure: "...It's far easier to leave the article on the shelf, to forget about owning an exotic pet or plant. Then you won't have to worry about permits and you won't be contributing to the trade in endangered species. You will be helping these animals and plants to remain in the wild where they belong. Without a consumer market, there would be no motive to kill or capture them."

Now if these statements are not off-putting then I don't know what is? You state that the advice was quoted out of context and clearly refers only to endangered species taken from the wild and for which CITES trade restrictions apply. That may have been the intent but the relevant statement about alligators and crocodiles clearly implies that they are all endangered, which fortunately is not the case. May we suggest that the brochures be re-written for it is the policy of the CSG and SSC/IUCN to support conservation through the sustainable use of wildlife. A number of crocodilians fall into this category and your brochure tends to undermine such a policy - even though it may be doing so inadvertently. -- H. Messel, Chairman CSG.

AND AGAIN DR. CAMPBELL. Dear Professor Messel: Thank you for your letter responding to my comments. It is easy for us as scientists, armed with the knowledge of species abundance, biodiversity, etc., and steeped in the complexity of CITES resolutions and their implementation, to make decisions regarding trade in wild fauna and flora. However, the public may not be so well informed. Many do not know the difference between alligators and crocodiles, let alone that these exist in many forms, some of which may be endangered.

One cannot expect those lacking taxonomic knowledge and any knowledge of CITES to determine if permits are required and to obtain them before departure. In many cases tourists would not be in a country long enough to obtain the permit even if they were cognizant of the requirements. So, does it not make better sense to advise the ignorant that, in general, it is better not to purchase articles fashioned from animal parts when out of the country when the purchase could result in forfeiture during customs clearance. The intent of the "offending statements" was to head off potential problems for uninformed travellers. Regardless your comments in regard to the wording are well taken and will be given consideration in redrafting the brochure. I would suggest that

deletion of the final two sentences of the second quotation would go a long way towards easing your concerns. Thank you for response to my comments. Yours sincerely, R. Campbell.
Canadian Wildlife Service.

EDITORIAL POLICY - The newsletter must contain interesting and timely, not outdated, information. All news on crocodilian conservation, research, management, captive propagation, trade, laws and regulations is welcome. Photographs and other graphic materials are particularly welcome. If you wonder why news from your area is not reported, it is because you have not sent it in. Whenever possible, the information will be published as submitted over the author's name and mailing address. Even if the editor has to extract information bit by bit from correspondence or other works, the revised news items will be 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 in the newsletter, please call them to the attention of the editors so 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.

MEETINGS

11TH WORKING MEETING OF THE CROCODILE SPECIALIST GROUP, VICTORIA FALLS, ZIMBABWE. 2 - 8 August 1992. Preliminary registration forms were distributed with the last NEWSLETTER. Nearly 200 responses have been received. To receive detailed information about travel, hotel reservations, registration, and program, return a preregistration form NOW to:

Caroline Peel, Spencers Creek Crocodile Farm, P.O. Box 18, Victoria Falls, Zimbabwe, Fax 263 13 4417.

If you lack a form just fax your name, address and fax/phone information to Caroline. Early preregistration is advised to secure accommodations. A draft schedule of topics and talks is being prepared and call for papers and posters, with detailed information for authors, will be distributed with the next NEWSLETTER.

REDUCED RATE TRAVEL TO CSG MEETINGS. The CSG is negotiating to arrange special group rate air travel for people traveling from the USA to Colombia (November 1991) and to Zimbabwe (August 1992). A special fare of \$386 return Miami-Santa Marta is available through the CSG travel agent. Contact the Gainesville office for information. Details of the Zimbabwe travel are not yet available but prices 30% to 50% below standard ticket fares are expected.

REGIONAL MEETING OF THE CSG, SANTA MARTA, COLOMBIA. 11 - 14 November 1991. Preregistration and Hotel Booking forms are enclosed. If you plan to attend, these forms should be completed and sent to addresses indicated.

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, Florida Museum of Natural History, Gainesville, FL 32611, U.S.A. Tel: (1) (904) 392 1721 Fax: (1) (904) 392 9367.

Africa: Vice Chairman: Dr. Jon Hutton, 16 Cambridge Ave., Highlands, Harare, Zimbabwe. Tel: (263) (4) 739 163 Fax: (263) (4) 708 554. Deputy Vice Chairman: Olivier Behra, Project TCP/MAG/8954, c/o FAO Rep, BP 3971, Antananarivo, Madagascar. Tel: (261)(2) 28831 WWF Fax: (261)(2) 33986.

Eastern Asia, Australia and Oceania: Vice Chairman: Dr. Grahame J.W. Webb, P.O. Box 38151, Winnellie, NT 5789, Australia. Tel: (61) (89) 221 355 Fax: (61) (89) 470 678. Deputy Vice Chairman: Brian Vernon, Mainland Holdings Pty. Ltd., P.O. Box 196, Lae, Papua New Guinea. Tel: (675) 42 6503 Fax: (675) 42 6172.

Western Asia: Vice Chairman: Romulus Whitaker, Madras Crocodile Bank, Post Bag No. 4, Mamallapuram 603 104 Tamil Nadu, India. Deputy Vice Chairman: Dr. Lala A.K. Singh, Project Tiger, Similipal Tiger Reserve, Khairi-Jashipur, Orissa, India 757091.

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