CROCODILE SPECIALIST GROUP

NEWSLETTER

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IUCN - World Conservation Union ■ Species Survival Commission

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IUCN--The World Conservation Union
Species Survival Commission

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COVER PHOTO: *Crocodylus acutus* photographed in the wild. Guajira, Colombia (see page 16). Geradro Abadia Klinge photo.

The CSG NEWSLETTER is produced and distributed by the Crocodile Specialist Group of the Species Survival Commission, IUCN - World Conservation Union. CSG NEWSLETTER provides information on the conservation, status, news and current events concerning crocodilians, and on the activities of the CSG. The NEWSLETTER is distributed to CSG members and, upon request, to other interested individuals and organizations. All subscribers are asked to contribute news and other materials. A voluntary contribution (suggested $40.00 US per year) is requested from subscribers to defray expenses of producing the NEWSLETTER. All communications should be addressed to: Dr. J. P. Ross, Executive Officer CSG, Florida Museum of Natural History, Gainesville, FL 32611, USA. Fax 1 352 392 9367, E-mail prosscsg@flmnh.ufl.edu

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EDITORIAL

WHO IS A MEMBER OF CSG? The editors receive occasional communications from readers asking if they are CSG members. About 1,000 individuals and organisations receive the Newsletter, but there are only 354 CSG members, so clearly, receiving the Newsletter is <u>not</u> an indication of CSG membership. Our membership process is that every three years the regional Vice Chairmen are invited to nominate individuals to be members of CSG for the next three year period. Additional members may be nominated at any time. In general, nominated members are those who have been active members in the past as well as additional individuals who by their interest and activities demonstrate that they are 'crocodile conservation specialists'. In keeping with our philosophy of conservation, members include academics and researchers, business people, crocodile farmers and others with specialist interest in crocodilian conservation. Following SSC policy, students are usually not nominated for membership. The Chairman of the CSG, Professor Messel, reviews and approves nominations and has the sole responsibility for appointing CSG members. Upon approval, members receive a letter from Professor Messel inviting them to serve for a three year period. The letter always requests that nominated members reply indicating their response and providing accurate contact information.

Thus, a member of the CSG is an individual who has received a letter of invitation from the Chairman and responded affirmatively to it. The last general renewal of membership occurred in October 1994 and the next should occur later this year. Individuals accepting membership to the CSG also automatically become members of the Species Survival Commission of IUCN and receive information and materials from SSC, including the SSC periodical 'Species'. Members serve in their individual capacity and do not 'represent' their region, country, industry, institution, preferred species or any other entity.

The rights and responsibilities of membership are outlined in the SSC member guidelines. Specialist Groups should pursue the conservation issues within their purview focussing through their group Chairman. Regional Vice Chairman serve as an additional focus for regional concerns. Members are an advisory network and also serve

as the 'action' arm of the SSC in their day to day activities. The work of the CSG includes assessing and monitoring the status of crocodilian species, responding to requests for information and expert advice, developing conservation strategy, promoting projects and conservation action, and communicating both within the Group and to the world at large. Members can be specially effective at keeping the CSG as a whole advised of developments, and alerting us to special situations and needs, in their own area of familiarity. The CSG cooperates with the CITES Secretariat and individual CITES Authorities providing expert information on numerous crocodilian issues. The Group serves as a forum and a clearing house for expertise on crocodilian conservation. The Opinion article following and the recently drafted reviews of CITES proposals (see pages 3, 4) are good examples.

Specialist Group Chairs are empowered to make interventions on behalf of their group, but not in the name of SSC or IUCN. Members similarly may identify themselves as CSG members but may not claim to speak on behalf of the Group (unless authorized by the Chairman). There is also an implicit commitment by persons accepting membership to adopt the general conservation ethic and policies which the CSG and SSC represent. However, understanding that there is a diversity of views on many points, and that developing general conservation policy is a basic Group function, vigorous, principled debate on all issues is a fundamental activity within the CSG.

The CSG uses the Newsletter as its basic means of communication and relies heavily on correspondence by letter, fax and e-mail between members and to and from the regional Vice Chairmen and Chairman to conduct business. A Steering Committee appointed by the Chairman meets periodically to assist the Chairman and advise on issues. Much day to day correspondence and coordination is accomplished by the Executive Officer, who is the CSG's only paid staff. Working Meetings are held every two years and, increasingly, Regional meetings organized by regional representatives are an important forum for the Group.

The CSG is therefore, basically, a global communications network focussed on the conservation of crocodilians and CSG members are those individuals who, responding to the invitation of the CSG Chairman, participate in this network. -- Perran Ross, *Executive Officer CSG.*

VIEWS AND OPINIONS

WHERE ARE THE RANCHES? I was greatly surprised to read in the NEWSLETTER that ranching contributed a very small proportion of the declared crocodilian skin production figures in 1993-1994 (Collins, 1996, NEWSLETTER 15(3):15). Based on the data in that article, one would conclude that the proportion (%) of skins produced by ranching (R), as opposed to wild harvest (W) or closed-cycle farms (C) is relatively low for *Caiman crocodilus* (R=0%, C=90%, C=10%), *Crocodylus niloticus* (R=10%, C=77%, W=1%), *Crocodylus novaeguinae* (R=0%, C=37%, W=55%), *Crocodylus siamensis* (R=0%, C=100%, W=0%), and only significant for *Crocodylus johnsoni* (R=84%, C=16%, W=10%) and *Crocodylus porosus* (R=23%, C=45%, W=16%). Overall, ranching is reported to be responsible for only 2% of crocodilian skin production, compared to 10% for wild harvest and 85% for captive breeding.

Ranching has long been touted as the preferred conservation/management tool by the CSG, implying that it is generally economically sound and of great conservation value. Ranching has been given special status for the management of CITES Appendix I species, largely because of its perceived role in the management of crocodilians.

It is therefore important that we investigate the apparent gap between the discourse and the statistics. The simplest explanation is that countries are reporting ranching production as captive-bred. In that case, the statistics should be revised, and an education campaign carried out to correct the notion among producing countries that captive breeding will be considered in a better light than ranching by conservation organizations.

The alternative explanation is more serious. If the statistics reflect the true situation, why is ranching still being pushed as an important conservation tool? Could it be that ranching is only serving as a temporary, politically-correct, stop-gap measure while farms bring their breeding stock up to economic levels? They then have production and the wild stocks become economically irrelevant. If you consider only economic returns, you can have your cake and eat it too.

I suspect that there may be elements of truth in both explanations. Crocodilian raising is a high-technology, capital- intensive agrobusiness. It is possible that it will develop in a manner opposed

to the general world economy. That is, there will be no tendency for the development of monopolies and stability of supply by technologically intensive production of stock; there will not be a tendency to substitute low value local stock by more valuable exotic species; and government regulations will be able to maintain economically inefficient, but environmentally and socially friendly, industries against international competition. Then again, it is possible that crocodilian ranching will not be viable in the long term.

There is a bias towards ranching in the discourse of many conservationists, and in CITES guidelines, but it is not clear whether we should consider this a guiding hand or an economic shackle. Perhaps we should put a moratorium on selling conservation/exploitation packages until the CSG completes a review of the long-term trends in the packages that have already been distributed. -- William Magnusson, *Dept. Ecologia-INPA, Caixa Post. 478, Manaus AM, Brazil.*

SPECIAL SECTION

CITES PROPOSALS. Four proposals pertaining to crocodilians have been submitted for consideration at the 10th Conference of the Parties to CITES, 9-20 June 1997 in Harare, Zimbabwe. The CSG was asked by IUCN Trade Program to assist with the review of these proposals and the preparation of technical evaluations which will be provided by IUCN to all participating Parties at the Conference. We were also invited to prepare an overview on crocodilian conservation that will be presented by IUCN. This work began in October 1996, has been completed over the last two months in the face of nearly impossible deadlines with extensive participation of many CSG members who gave detailed reviews, and comments. These include the following, to whom our thanks: H. Andrews, O. Behra, L. Collins, D. David, I. Games, J. Hutton, D. Jelden, R. Jenkins, A. Larriera, J. Loveridge, W. Magnusson, C. Manolis, J. Thorbjarnarson, A. Velasco, L. Verdade, B. Ortiz, L. Pacheco, T. Waller, G. Webb, R. Whitaker, A. Woodward.

The draft comments prepared by IUCN Trade Program from these inputs were circulated to the Steering Committee and approved by the CSG Chairman, Professor Messel, and are presented here as a basis for further discussion of these proposals, which will culminate at a CSG Steering Committee in Harare during the first few days of COP 10. Additional comments and updates on the proposals should be addressed to the appropriate regional Vice Chairman or the Executive Officer.

IUCN GENERAL COMMENTS ON CROCODILIAN PROPOSALS AT CITES, DRAFT 19 MARCH, 1997. Four proposals concerning crocodilians are before the 10th COP. Three of these (Nile crocodiles in Uganda and Madagascar and broad snouted caiman in Argentina) request downlisting of populations of crocodilians to Appendix II under Conf. Res. 3.15 ranching and the fourth proposes extension of a quota for wild harvested Nile crocodiles in Tanzania. None of these populations are endangered or threatened and in each case substantial benefits for the conservation of crocodilians and their habitats can be linked with the proposed activities.

These proposals continue the process of development of sustainable use programs for crocodilians as a mechanism for their conservation which has been recommended by IUCN and its Crocodile Specialist Group. By channeling international trade in crocodilian skins into legal routes under CITES regulations, crocodilian conservation has been placed on a sound footing with demonstrable beneficial effects.

The proposal from Argentina will allow the collection of a portion of the eggs *of Caiman latirostris* in Santa Fe province. Some of these will be retained for population re-enforcement (restocking) while the remainder will be placed with commercial facilities for grow out. As the bulk of caiman habitat in Santa Fe province is in the hands of private owners, and a major threat is the loss of wetlands to agricultural use, the program will provide incentives to land owners to maintain their wetlands. The program will be limited for the time being to the province of Santa Fe and will only be extended to other areas as these achieve an adequate level of caiman population assessment and monitoring and husbandry skills.

In Uganda the proposal is to continue the collection of crocodile eggs from the population in the lower Murchison Falls area for grow out in ranches. The Murchison Falls population is regularly monitored and demonstrates stability, or possibly slight increase, at the current rate of egg harvest. Funds generated from the egg harvest

will be placed in a special fund to support crocodile conservation and management. Although this activity is planned in a National Park, the IUCN's crocodile experts are confident that the population will be maintained, both at a biologically adequate level, and as a viewing phenomenon for tourism.

The Malagasy Republic proposes a similar scheme. Local communities are involved in collecting crocodile eggs in the Bessalampy region of western Madagascar for sale to crocodile ranches. This returns an economic benefit to local communities who otherwise have no incentive to conserve the crocodiles, which they regard as dangerous vermin.

Crocodile populations are well suited to controlled harvest of their eggs for use in ranches. Naturally high mortality of eggs and new hatchlings, and population recruitment processes largely dependent on the structure of the adult population, make it possible to remove eggs with a negligible effect on recruitment. Detailed studies by IUCN members over many years and in many countries have provided a sound biological basis on which such programs are based. Crocodile ranching is a robust conservation tool with proven beneficial application. At the same time providing economic benefits at the local level as an incentive to conservation of crocodiles has important spin-off benefits to all the organisms occupying the crocodile wetland habitats.

The proposal from Tanzania requests continuation of a harvest of wild crocodiles which poses some more difficult questions. Crocodile populations in Tanzania are large, but confined primarily to protected areas, game reserves and national parks. Outside these areas, while crocodile populations are sparse, the high density of rural people living near rivers has led to an unacceptable hazard to livestock and human life. Part of the proposed quota is to remove dangerous crocodiles near human habitation, however, available data suggests that a quota of around 200/year is sufficient for this purpose. Additional wild crocodile harvest will be allocated to the owners of developing crocodile ranches to provide needed financial revenue while the ranching program achieves operational success. Harvest of wild crocodilians is a component of national management and conservation programs in many countries, however, such wild harvest requires stringent regulation and controls which are not evident in the Tanzanian proposal. Procedurally, submission of a proposal under Conf. Res. 3.15 may be unnecessary in this case as the Tanzanian population is already listed on Appendix II (Ranching 3.15). Additional negotiation between the proponent, the CITES Secretariat, and appropriate expert bodies (including the IUCN Crocodile Specialist Group) may be adequate to ensure that any wild crocodile harvest quota is biologically justified and meets the conditions set out in Conf. Res. 8.22 for such changes to ranching programs.

In all cases, the existing structure of special tagging requirements for crocodile skins (Conf. Res. 9.22) combined with CITES export permits, ensures that skins in trade are from legal and sustainable sources. Taken as a whole, these proposals will continue the orderly development of controlled trade in crocodilian products under CITES as an incentive for the conservation of crocodilian species and their habitats.

MAINTENANCE OF THE MADAGASCAR POPULATION OF NILE CROCODILE *CROCODYLUS NILOTICUS* ON APPENDIX II PURSUANT TO REESOLUTION CONF. 3.15 ON RANCHING. The Madagascar population was transferred to Appendix II in 1985 pursuant to Resolution Conf. 5.21, subject to an export quota. Although Madagascar has submitted proposals to transfer its population to Appendix II pursuant to Resolution Conf 3.15 on ranching in 1989, 1992 and 1994, these have not been accepted by the Parties and the quota system has remained in effect. The quotas approved in 1992 and 1994 were primarily for ranched animals, as follows: 1992: 3,000 ranched + 100 nuisance; 1993: 4,000 ranched + 100 nuisance; 1994: 4,300 ranched + 100 nuisance animals; 1995: 4,500 + 100 nuisance; 1996: 5,000 + 200 nuisance; 1997: 5,000 + 200. The species is not listed as globally threatened by IUCN. The supporting statement is vague on the overall status and distribution of the species in Madagascar. However, reviewers note that if the proposed CITES project S-102 proceeds it would address the necessary steps to establish a ranching programme.

1. Status: In Madagascar, the major areas of crocodile habitat occur on the west coast with only a few small areas on the east coast. In 1992, Madagascar's crocodile population was estimated to include 21,000-34,000 animals in accessible habitat, (see IUCN 1994 Analyses). The density estimates presented in the literature vary considerably, but it is clear that the Malagasy crocodile population was severely depleted by over

hunting in the past. Although the current supporting statement is very vague on the overall distribution of crocodiles and their current status in Madagascar, it does provide a clear description of the distribution of crocodiles in the Bessalampy region on the west coast where egg collection is concentrated.

The status of crocodiles in the Bessalampy area can be inferred from the results of monitoring egg collection in the area since 1990. The mean clutch size remains stable at 38-40 eggs and the large variation in clutch size, with many nests smaller than the mean, suggests that smaller/younger females continue to be recruited into the population. The number of nests collected has oscillated from 30 (1,083 eggs) in 1990 to 150-160 (circa 5,000 eggs) in 1994-96, well below the estimated nest production in this region of around 270 nests (10,000 eggs). Because nest collection effort is not constant, the egg collection data provide only a general indication of population status. Reviewers note that an improved and standardized method of monitoring the effects of egg harvesting is needed. However, reviewers concur that crocodiles are not in danger of extinction in Madagascar (although disappearance from some localities near human habitation is already occurring) and that harvest at the current level is certainly sustainable.

3. Utilization and Trade (section for completion by IUCN)

4. Proposed utilization under the ranching scheme: According to the supporting statement, 4 ranches have been established, two based on the collection of eggs and two reliant on the collection of hatchlings.

Although not mentioned in the supporting statement, the ranching program is intended to proceed in conjunction with a CITES funded project for technical aid (proposal S-102) that aims to determine crocodile distribution, initiate population monitoring, inventory ranch stocks and develop a scheme for sustainable utilization of crocodiles in Madagascar (in effect all the necessary steps needed to establish a ranching program). These activities are critical to the proposal meeting the requirements of Res. Conf. 3-15. Should the proposal for technical aid be unsuccessful, Madagascar would need to meet these requirements by an alternative mechanism.

Following a visit in October 1996 to review crocodile ranching in Madagascar for the CITES Secretariat, Nash (1996) observed that: "egg collection is well managed, hatchling collection is limited in scale and is a temporary measure, export controls are adequate and although commercial hunting has been problematic to control, it will be stopped indefinitely. The quota of 200 problem animals is adequately controlled, but more than 200 animals are hunted as problem animals. Although illegal hunting is still problematic, it is almost entirely for the domestic trade for finished products and is limited by the low demand for products and by the relatively poor quality of the products (similarly illegal export trade is limited by the poor quality)."

Anecdotal information suggests that egg collection has been highly beneficial to local communities and consequently villagers are increasingly protecting adult crocodiles. Reviewers note that expansion of the ranching program would bring benefits to a wider number of local communities, and enhance the conservation of crocodiles in a wider area. Thus, Nash (1996) concluded that the conservation of the Nile crocodile in Madagascar would be enhanced by a full Appendix II listing, whereas retaining the quota system or returning the Malagasy population to Appendix I would be counter productive to conservation.

The supporting statement does not provide sufficient information on the current control and regulatory measures in place, export controls, inspection and skin tagging requirements and numerous other functional details of an effective ranching program. However, noting Nash's recommendations above, it would seem that acceptance of the proposal should be accompanied by a clear limit ('quota') of exports tied to current and projected ranch production; the implementation of the proposed project S-102; and a review of the effectiveness of this project at the next COP to ensure that the necessary components are in fact adopted.

MAINTENANCE OF TANZANIAN POPULATION OF NILE CROCODILE, *CROCODYLUS NILOTICUS* IN APPENDIX II SUBJECT TO AN EXPORT QUOTA OF 1,100 FOR 1998, 1999 AND 2000. Tanzania's population of Nile Crocodile, *C. niloticus,* was transferred to Appendix II in 1985 pursuant to Resolution Conf. 5.21, subject to an export quota. A proposal to maintain this population on Appendix II pursuant to Resolution Conf. 3.15 on ranching was approved in 1992, with the following export quotas: 500 (100 trophy + 400 nuisance animals) for 1992 and 300 (100 trophy + 200 nuisance

animals) for 1993 and 1994. In 1994, under the provisions of Resolution Conf. 8.22, special quotas of 1,000 animals for control of nuisance animals and 100 for sport hunting were agreed for 1995 and 1996. Extension of the 1995 and 1996 special quotas was made contingent on Tanzania submitting a report on the wild harvest in 1995 and 1996. To fulfil the requirements of Res. Conf. 8.22, the report was required to include information on annual harvest: number, size and location of animals harvested, the mechanisms for control and export of this quota, and continued information on crocodile human interactions. The species is not listed as globally threatened by IUCN.

Nile crocodile, Zimbabwe. P. Ross photo

The current proposal seeks to continue the export of 1,000 wild skins and 100 sport trophies annually to supplement the income and development of the ranching programme. The proposal is accompanied by a report on crocodile population surveys. The survey report presents good crocodile population monitoring results, but reviewers conclude that the supporting statement fails to address adequately the need for a quota of skins to be taken from outside Protected Areas and other reporting requirements. As the Tanzanian population of *C. niloticus* was transferred to Appendix II in 1992, the operational part of this proposal is the request for a continuation of the wild harvest, which should be assessed according to Resolution Conf. 8.22.

1. Status: As indicated in the supporting statement, *C. niloticus* appears to be a widespread and relatively common species in Tanzania. The survey report presents strong evidence that the populations of *C. niloticus* in the Selous Game Reserve, Grumeti, Mara, Rubondo and Ruaha rivers are substantial and are either stable or increasing. However, these populations are on the whole within protected areas. In 1985, the Tanzanian population was estimated at 74,000 animals. In 1995, (Supporting Statement) Games and Severre produced an estimate of 40,000 - 80,000 animals for the Selous Game Reserve alone, this estimate has not been disputed by reviewers. Indeed, the total population may reach 100,000 animals, with approximately 80% within the Selous Game Reserve.

Crocodile habitat in Game Reserves and National Parks is fully protected and is stable in extent; Game Reserves and Protected Areas cover approximately 25% of Tanzania. Collection of adult crocodiles, other than sport hunting, is prohibited in Reserves.

2. Utilization and trade: In 1995, only 101 crocodiles are recorded as being killed as nuisance animals, none are reported for 1996. In the 1995-1996 quota period, 698 skins are reported as being exported under the wild quota, these figures differ from those reported to the CITES Secretariat by Tanzania: 584 commercial skins and 150 hunting trophies in 1995 and 100 commercial skins and 37 hunting trophies in 1996 (871 total). Most of these skins were from the wild, however, 200 of

the skins exported in 1995, originated from a ranch. It is notable that in no year has the reported skin export approached the full quota. It is very unclear whether Tanzania has adequate or accurate reporting of crocodile skin exports thus, extension of a wild quota of 1,000 for nuisance control would seem impossible as the reporting requirement has not been met.

3. Proposed utilization based on the export quota: It is proposed that 1,000 wild skins will be obtained from outside Protected Areas in 1997/1998 and that future quotas will be issued at subsequent Meetings of the Conference of the Parties. Thereafter, Tanzania will allocate portions of the quota for wild harvested skins to ranch owners. Profits from the export of skins obtained in this way are intended to supplement the income and development of the ranches. The supporting statement adds that wild populations will be hunted on a rotational basis and that hunting in the wild will be managed by wildlife officials.

Reviewers concur that there is insufficient evidence to suggest that harvest of wild specimens outside Protected Areas would be sustainable. They also note that crocodile control measures require no more than 100-200 crocodiles to be eliminated annually, presumably outside Protected Areas. Neither the supporting statement nor the accompanying report satisfactorily addresses the association of wild crocodile harvest with nuisance control, as required by CITES in 1994. In addition there is no indication of the number of adults to be taken from each of the populations in the rota system or, which part of the population will be targeted for harvest (for example adult males, or non reproductive individuals).

Reviewers expressed concern that unsustainable cropping of wild populations is now occurring without a clear strategy for crocodile management and development of the ranching industry and conclude that 200 crocodiles for problem animal control + 100 trophies should be sufficient, and do not recognize the need for extra revenue to support further development of the ranches.

As noted in the supporting statement, Tanzania's crocodile ranching industry still requires considerable development. The reports provided suggest that existing ranches are very inefficient and that further information on the status of crocodiles in existing ranches should be provided. Reviewers also note that local community involvement in crocodile ranching operations around protected reserves has still not been initiated as a management option. However, despite the above reservations, the first export from a ranch is an encouraging indication that the system is slowly achieving success.

With regard to control measures, the proposal reports that all skins are inspected by wildlife officials and tagged, but it is not clear whether they are tagged at source. There is a need for clarification of regulations to ensure that the wild harvest does not lead to uncontrolled exploitation of crocodiles. The common components for a controlled system include: licensing of hunters; controlled hunting seasons; strict size limits based on biological criteria; verification by the authorities of legally killed crocodiles and their immediate tagging, along with a system to carefully report the results.

MAINTENANCE OF THE UGANDA POPULATION OF NILE CROCODILE, *CROCODYLUS NILOTICUS* APPENDIX II PURSUANT TO RESOLUTION CONF. 3.15 ON RANCHING. The Uganda population of *Crocodylus niloticus* was transferred to Appendix II in 1992, pursuant to Resolution Conf. 7.14 for an export quota. The species is not listed as globally threatened by IUCN (1996). The present proposal seeks to maintain the Uganda population of *C. niloticus* on Appendix II in order to harvest eggs for ranching and requests an additional quota of up to 25 wild harvested adult skins for nuisance crocodile control. Reviewers note that the harvested population in the Murchison Falls National Park (MFNP) appears to be stable and congratulate Uganda on the development of its policy on crocodile utilization. However, reviewers note that the question of the conservation benefits of the ranching programme needs further elaboration.

2. Status. The Nile crocodile is widely distributed throughout sub-Saharan Africa. As a whole *C. niloticus* is not threatened, and locally large populations exist (Thorbjarnarsson 1992). The supporting statement provides a comprehensive description of the current distribution of the species within Uganda, where potential crocodile habitat appears to be extensive, comprising over 40,000 square km of wetlands. The data suggest that the Nile crocodile occupies most of its historical range in Uganda, although densities have decreased since the 1960s the species has only been extirpated locally near residential areas. Reviewers conclude that the

Ugandan crocodile population does not appear to be threatened with extinction, but note that inadequate controls on harvest and trade could result in the population being threatened in the future.

Due to a number of factors the data on population tends are irregular in timing, but in 1996 Uganda initiated a new series of aerial and night counts to serve as a baseline for future monitoring (unfortunately, the variance estimates from these counts were not presented, limiting their future value in monitoring population tend). Crocodiles were found in 36% (144 km) of the area surveyed by air, and density, calculated from aerial and night counts ranged from 0 - 18 animals per km. The survey noted a decline in crocodiles since the 1960's, but that the population in the harvested areas of MFNP appeared stable. In addition, low crocodile densities were documented in at least five locations in addition to Murchison Falls National Park. Although it is difficult to draw conclusions from the 2 years of survey data provided in the proposal, the *C. niloticus* population seems to have increased throughout its range in Uganda over the past 5 years.

From the available information, the Murchison Falls population is the only population of suitable size and protected status to be suitable for harvest at present. According to the supporting statement, between the Murchison Falls and Lake Albert, the crocodile population currently numbers over 200 non-hatchlings and the numbers of crocodile nests appear stable, or possibly increasing, at around 100-120 nests/year. The ratio of adults to subadults to juveniles in the egg collection area was 1:1.1:1 in 1991, but in the 1996 survey this had changed to 5:2:1, which is attributed to the level of egg collection, but which may also reflect stabilized size structure of large adults, expected as a population recovers from earlier hunting. Reviewers note that continued accurate monitoring and careful evaluation of the harvest level will be crucial components of the program to ensure sustainability.

3. Trade and utilization. Uganda has had a quota of 2,500 skins per annum from 1992-1997. Manolis notes that information on where recorded harvest took place is absent.

4. Proposed utilization under the ranching scheme. The proposed egg harvest of 4,000 eggs/year remains at the same level as over the previous five years, and is estimated to account for about 80% of eggs produced. Simulation models suggest that an egg harvest rate of 90% should be sustainable (Craig *et al.* (1992). However, the harvest rate is expected to be balanced by a release of 5% of surviving offspring back into the system annually; although to date, this rate has not been achieved. As nest collections are limited to a relatively small portion of the range within Uganda and not all nests are collected, it is unlikely that the rate of harvest proposed will threaten the survival of the population. Although, the high proportion of adult crocodiles counted suggests that re-introducing juveniles is having a negligible effect on recruitment, the population appears to be increasing. Other alternatives to the re-stocking program should be considered as the program develops, including i) reducing egg take by an equivalent proportion (approximately 350 eggs) and waiving the restocking requirement; ii) continuing restocking on an experimental basis to ascertain if it is effective; iii) restocking in other protected areas where the density of adult crocodiles is low and population enhancement is desired.

Uganda expects to be in a position to export ranched skins from juveniles in 1997 and has also proposed an export quota of 25 adult skins from problem animal control, which is very conservative. The disposition of these skins is well defined and co-ordinated with farm-skin exports.

Crocodile management in Uganda has been allocated to a new agency, the Uganda Wildlife Authority and the supporting statement is greatly enhanced from its draft version by the addition of annexes detailing the proposed management policy for crocodiles in Uganda. The management plan limits sustainable use to egg harvest for ranching and proposes a procedure for licensing and monitoring crocodile ranches. Ranchers are required to submit detailed reports of egg harvest, ranch mortality and production. Additional detailed management requirements are given for the population on MFNP. These involve licensing for ranches, orderly egg collection and reporting procedures, continuation of the restocking, a ban on fishing to protect adult crocodiles and the hiring of wardens at the ranch's expense to protect nesting areas. Extension of egg harvest to other areas is made contingent upon demonstrating adequate crocodile populations in the future. The marking system identified is standard, but that the means of distributing tags to ranches, and the question of who will attach the tags and whether skins will be inspected prior to export are not addressed.

While the benefit to local communities is presented as one justification of crocodile ranching, it is unclear where local communities derive benefits from the proposed harvest in MFNP (except perhaps by employment as collectors and wardens). This point needs further examination. Funds from the sale of nuisance control program skins will be deposited in a special fund to support crocodile conservation.

TRANSFER OF THE ARGENTINE POPULATION OF THE BROAD-SNOUTED CAIMAN, *CAIMAN LATIROSTRIS* FROM APPENDIX I TO APPENDIX II PURSUANT TO RESOLUTION CONF. 3.15 ON RANCHING. *Caiman latirostris* has been listed in Appendix I since 1975. The present proposal seeks the transfer of the Argentinean population of the species to Appendix II in order to initiate export of products derived from a ranching operation in Santa Fe Province. Argentina is organized on a federal system, and so far only Santa Fe province has in place the necessary legal and supervisory infrastructure required for effective monitoring and management of ranching operations. Reviewers note that *C. latirostris* is thought to be increasing in Argentina following the cessation of hunting in 1990 and that the experimental ranching project has been carefully implemented. As the majority of caiman habitat in Argentina occurs on private lands it is hoped that this ranching programme will provide landowners with an incentive to conserve this habitat. Reviewers note that further information is needed on the means proposed to verify tagging and export of ranched products.

2. Status. The species is not listed as globally threatened by IUCN (1996). The supporting statement cites Medem (1983) and Scott *et al.* (1990) in summarizing the current distribution of the species which is restricted to the Atlantic coast drainage in Brazil south of the Amazon, Uruguay, Paraguay, and northern Argentina, where it is principally a marsh- and swamp-dwelling species. Although sympatric with *C. yacare*, *C. latirostris* is found in more densely vegetated, quieter waters (Thorbjarnarsson 1992). Reviewers note that the Argentinean population of *C. latirostris* is not geographically separate from other populations of the species. Although little quantitative information is available on either current population levels or recent trends, the population in Argentina is considered to be the most secure of that in all range States. Qualitative information suggests that in northern Argentina the species is widespread and locally abundant, having increased in number since the cessation of commercial hunting around 1990. Reviewers note that habitat loss to agricultural activity remains a threat.

The proposal refers to information in previously published sources (particularly Larriera 1988-1995, numerous citations) which are only briefly summarized in the proposal. This information establishes the distribution of *C. latirostris* in Santa Fe Province and suggests that the total available habitat for caiman in Santa Fe province is over 20,000 square km. Caiman studies and restocking programs have been developed on about 20% of this area and surveys over the last six years on representative sample sites indicate that the population is secure. While raw counts of caiman during surveys on eight sample sites appear to have increased by several orders of magnitude since 1990, interpretation of these data is difficult. The sample localities have changed from year to year and no details on survey distance or area are given. The survey sites are evidently the sites of restocking with captive raised stock and so the increases may combine natural increase and newly released juveniles. Observations of adult caiman in some areas suggest densities comparable to those of American alligator in the USA and *Caiman crocodilus* in Venezuela and Nicaragua which are at, or near, their carrying capacity and support extensive sustainable harvest. For the future it is recommended that the population monitoring sites be standardized. Routine counts and mapping of nests during egg collection can also be used as an index to monitor population trends of harvested populations.

4. Proposed utilization under the ranching scheme. The proposed ranching program is based on centralized collection and incubation of eggs by Project Yacare, a joint government - private initiative. Incubation and growth results in the pilot phase of the project have been at, or exceeded, normal commercial levels, testifying to the competance of the project. The hatching rate varied from 61% to 87% and averaged 70% from 1990-1996. The supporting statement envisages that the resultant hatchlings will be divided between the continuing restocking project and private commercial growout. A maximum of three commercial ranches and a harvest increasing from 2,500 to 6,000 eggs/year by year 2000 is proposed. According to reviewers, this is a fairly conservative level of egg harvesting. Egg harvests

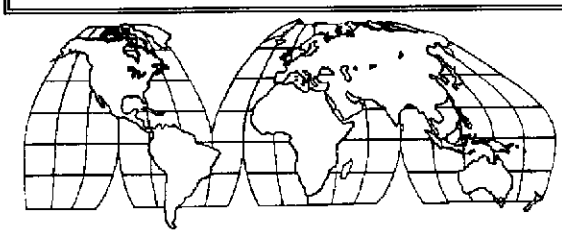
during the experimental phase of the program have risen to 84% of nests laid in the study areas (which comprise about 20% of the total habitat area in Santa Fe). This high level of egg harvest is justified in the proposal by the increased density of the populations due to restocking, and the protection of nests in the remaining 80% of the habitat. From 1991-1995 on average, 89% of hatchlings were returned to the wild. Under the proposed egg collection quota, the proportion of hatchlings returned to the wild will decrease to around 30% of collected eggs by the year 2000. Reviewers recommend further study to determine the success of the restocking.

The legal basis for caiman ranching is national law 22.421 regulated by decree 691/81 which established the application of CITES in Argentina and Santa Fe Law for the protection of Fauna and Flora No. 4830 establishing the basis for the joint state-private sector ranching. The national law provides for fines equivalent to US $5,000 - $1 million for infractions. Killing Caiman of all sizes is prohibited and illegal killing is negligible.

The supporting statement describes a program of tagging all hatchlings at birth; monitoring ranch production and mortality; tagging skins for domestic use; use of transport permits to move skins from ranches to export ports; and hygienic handling of meat for domestic consumption. The proposal still lacks a description of the process of inspection and verification of exports and tagging to meet Res. Conf. 9.22. It would be valuable for the Management Authority to clarify its intentions in this regard.

The supporting statement presents the conservation benefit of the proposed ranching operation as increasing the value of caiman to local landowners to provide an incentive to maintain wetland habitats as the majority of habitats occupied by caiman are on private lands. The expectation is that the project will be a substantial benefit for the continuing conservation of *Caiman latirostris*. The supporting statement proposes that the expansion of ranching to other provinces will be dependent upon them achieving similar levels of information about caiman population distribution and status, monitoring programs and technical ranching competence. These include quantitative criteria for the minimum area of caiman habitats that must be surveyed (40%); the effective participation of state personnel in development of the ranching process; and final approval by the CITES Standing Committee for such expansion. These appear to be adequate safeguards.

AREA REPORTS



ASIA

China

CHIANGXING CONSERVATION AREA FOR CHINESE ALLIGATOR. The first Chinese alligator conservation area run by local people and subsidized by the state was founded in Yingjiabian village, Guandi county, Changxing prefecture, Zhejiang province of P.R. China and has proved to be a great success during the last 10 years. This conservation area is located on the Changsi Plain in the middle lower Yangtze river and has a warm climate and quiet environment. There are rivers and ponds across the plain with rich bamboos and flourishing grasses. The facility built for Chinese alligator propagation comprises 0.67 ha rearing and breeding farm with ten pools (total area 2,400m^2), 171 m^2 simply equipped shelters, 42m^2 glass hothouses, 1 km of low voltage electric lines and a total of 122 ha built for alligator propagation. There are two full time alligator raisers and four part-time administrators for the farm.

Probably it is one of the smallest reserve areas in the world, but it is an alligator 'paradise' developed by the diligent villagers of Yingjiabian. Starting with 3 alligators in 1979, the stock is 144 alligators now, which is 80% of the total number in the province and the second largest population in the country (or the world! --*Eds.*).

Older villagers in Yingjiabian recall that during the 1950's more than one hundred alligators were caught annually and many eggs collected. The largest alligators caught weighed 48.5 kg. In November 1988 the Forestry Department of Zhejiang province authorized the

building of the Changxing Chinese alligator conservation area to be run by local people and subsidized by the state. In September 1992 the National Forestry Ministry issued a "licence for rearing and breeding national major rare wildlife."

Natural propagation was found to be successful in the conservation area. For twelve years male and female alligators had a fixed mating season from 23rd May to 27 June. They made their own nests on 10 occasions, laid 236 eggs and hatched 208 young (88% of eggs laid) of which 170 have grown up (82% hatchlings surviving). It is not only more efficient but also has a higher hatching rate and lower costs than propagating the alligators in artificial habitat. Since the foundation of the area more than 600 units and 10,000 people have come to visit or conduct scientific research.

The Yingjiabian Alligator Conservation Area has established three long term programs. The first is to invest money to expand the breeding farm, to make full use of natural propagation for population growth and to introduce stock from other areas to avoid inbreeding. The second is to set up an alligator lake to promote tourism. The third program is to conduct scientific research on reasonable utilization of alligator to establish a multifunctional alligator research center including conservation, propagation, production and utilization. -- Wang Jingzhi, *University of International Business and Economics,* & Huang Zhujian, *Inst. of Zoology, Academia Sinica, Beijing P.R.C.*

LIVE ALLIGATOR EXPORTS AUTHORIZED. In December 1996 the CITES Management Authority for Germany received an inquiry from a German breeder about whether an import permit would be issued for live Chinese alligator from the Anhui Research Center of Chinese Alligator Reproduction (ARCCAR). ARCCAR is a registered breeding facility for *Alligator sinensis* (A-CN 501) but the German Authority was uncertain whether this registration included living specimens as well as skins and products and so an inquiry was directed to the CITES Secretariat. In investigating this matter the German authority was informed of a price list of available reptiles from China quoting $20.00 US per linear centimeter for Chinese alligator hatchlings.

In response the CITES Secretariat took up the matter with a representative of the Chinese Management Authority and has established that the entry in the CITES Registry of Captive Breeding Operations will be amended to include live animals. The Secretariat therefore has no objection to the acceptance of appropriate documents from China for live, captive-bred Chinese alligators from ARCCAR. -- *from correspondence, submitted by* D. Jelden, *Bundesampt fur Naturschutz, Konstantin Str. 10, Bonn 53179, Germany*

Indonesia

REVIEW COMMITTEE REPORT. The third CSG review committee visited Indonesia 14 - 22 February 1997. An exhaustive schedule took the committee members, H. Messel, D. Jelden and S. Broad, to Jakarta, Kalimantan, Irian Jaya and Batam for inspection of facilities and discussion with PHPA regional and headquarters personnel. Discussions were focused around 6 major topics; Species issues, Administrative structure, The Management Plan, Monitoring and reporting, Training, and Enforcement. Major findings and recommendations extracted from the committees report are presented here.

Previous CSG reviews recommended clarification of the distribution and taxonomic status of crocodiles in Indonesia. As the current ranching management program focuses primarily on the populations of *C. porosus* and *C. noveaguineae* in Irian Jaya, this shortcoming is not considered a major constraint. The committee recommended that PHPA address the need of solving the taxonomic problems of crocodiles in its management program which will affect future conservation and management.

The committee noted significant progress was made regarding the distribution, abundance and habitat of *Tomistoma schlegelii* as a result of the joint Indonesian/Australian survey in southern Sumatra. Information is also now available from Kalimantan on both *Tomistoma* and *C. siamensis*. The committee recommended that assessment of the status of these two high conservation priority species be combined and eastern Kalimantan should be a primary target area for future work.

The review committee was informed that the Crocodile Conservation Task Force has been terminated and that its functions have been transferred to PHPA headquarters since 1995. In addition the committee was pleased to learn of improved coordination between PHPA and LIPI

(the CITES Scientific Authority) in the development of population surveys.

The draft Crocodile Management Program for Indonesia prepared in 1996 was revised based on initial comments of reviewers and a second draft prepared in early 1997 was presented for discussion. The committee acknowledged the substantial improvement in the establishment of regulations as a strong foundation for the management of sustainable use programs for crocodiles. Specifically, Decree 424/KPTS-VI/1994 and Decree No 93/KPTS/-DJ-VI96 now provide a legal basis for the implementation of the management program. Following long discussion a number of recommendations to further improve the document were made.

The necessary legal framework is now in place, including sanctions for non-compliance with the program. Reporting to CITES has improved considerably and the tagging system adopted meets the basic CITES requirements. The committee recommended that the management plan be amended to express a clear intention to ensure compliance with CITES recommendations. The Review Committee was informed that Indonesia intends to produce lists of permits for transmission to the CITES Secretariat and this should be clearly indicated in the management plan. The committee expressed concern that the long term sustainability of the program could not be adequately assessed until proposed population monitoring was implemented. The impact of current and proposed levels of harvest cannot be assessed but the basic premise of the management program appears sound in that it would prevent the capture of adult reproductive crocodiles. The committee therefore endorsed the basic framework of the Management Program. However, proper implementation of a crocodile monitoring system was stressed as the most fundamental requirement for success. The committee expressed strong support for the components of the Irian Jaya program which provides positive economic return for indigenous communities.

Several levels of monitoring are in operation in Indonesia including monitoring crocodile populations in the wild, the number of crocodiles on farms, and the volumes of skins traded internally and internationally. Licensed farms, tanneries and exporters are asked to report monthly inventories of live animals and skins to local PHPA offices who report every three months to PHPA headquarters. A fundamental change is that there are now legal obligations on farmers and tanners to comply with reporting requirements, which is a significant improvement.

The management program indicates that wild harvest of crocodiles in Irian Jaya will be monitored in three geographic zones. Some new surveys have been conducted in the Birdshead region in conjunction with LIPI but the raw survey data are held only by LIPI. The committee expressed concern that in the other two regions (Mamberano and Merauke) no new surveys have been carried out since 1993 despite on-going wild harvest. The committee discussed with PHPA the need to establish appropriate methodology for repeatable surveys in selected areas of Irian Jaya, including sites in each of the three management regions. PHPA expressed its strong commitment to introduce such population monitoring and funding such surveys through Indonesian sources.

Wild harvest of crocodiles has continued in Irian Jaya throughout the period of the export moratorium. Only one farm has regularly purchased skins (100-150/month) and has maintained excellent monthly records on species, tag number, size and source, reported to PHPA. Two other operations are reported to have recently begun buying skins but have not yet reported to PHPA. The committee was impressed with the reporting of wild harvest by the main operation involved, but concerned about the apparent lack of adherence to regulations of other operations. PHPA needs to apply strict implementation of the licensing and reporting requirements and no wild collection for ranching should be allowed outside Irian Jaya until the system in that province is operating in an effective manner.

A summary report of all farm stock held in Indonesia as of December 1996 was included in the Management Program. Overall, the level of cooperation by farmers and traders increased and the newly standardized forms have been introduced. However, some of the detailed records proved inaccurate and the information held at the regional office in Jayapura was incomplete. The lack of commitment by some owners to their farming operations since the introduction of the export moratorium has complicated PHPA's attempts to improve reporting as only three of 14 farms registered in Irian Jaya are considered to be active. One farm in Irian Jaya continues to purchase about 500 juveniles/month and another has purchased about 100 in 1996. One issue of considerable concern was the recent acquisition of 27 hatchling *Tomistoma* on a farm in Kalimantan. This appeared entirely inappropriate for a

threatened species and should not be allowed without strong scientific justification.

Substantial stocks of skins have accumulated in Indonesia during the moratorium. PHPA records indicate that around 12,000 *(C. novaeguineae)* and 6,000 saltwater (*C. porosus*) skins were held by registered traders at the end of 1996. This stock needs close monitoring. The origin of all skins in the stock needs to be distinguished to allow identification of wild, ranched or captive bred skins by means of an internal tagging system. The large stockpiles that currently exist should only be exported after local PHPA staff have inspected, tagged and confirmed the legality of the skins. Although some skins were accurately documented by traders, the committee was disturbed to discover approximately 600 skins held by a trader in Jayapura which had not been reported in writing to PHPA or tagged.

Annual CITES reports have been sent to CITES for all years up to 1995. For monitoring wildlife exports PHPA has set up a sophisticated and well functioning computer system that readily allows comparison of the number of specimens permitted for export with the annual quota for that species.

Several PHPA staff have now attended special training courses in wildlife management and some have taken courses with a focus on management of crocodilians in captivity and in the wild. Recently a PHPA staff member trained overseas in crocodile management has taken a post in the PHPA office in Jayapura to assist the improvement of the monitoring program. Despite significant progress, continuing emphasis in training should be given in the compilation and analysis of monitoring data and the development of clear and unambiguous reporting.

PHPA reported making significant efforts to ensure enforcement of the moratorium and related trade controls. The committee was informed of the seizure of 92 skins in August 1996 which lacked a necessary transport document. While some illegal export appears to have escaped Indonesian authorities (e.g. seizures in Thailand of crocodiles from Irian Jaya), nevertheless, the committee heard no indication of significant smuggling activity.

In its final recommendations the dramatic improvement of crocodilian management in Indonesia was noted and the following detailed recommendations made.

1. The moratorium could be lifted when PHPA is satisfied that the following issues have been addressed:

- all skin stocks intended for export should be inventoried (tag number, species, size and owner) and reported to the CITES Secretariat before being eligible for export.

- any skins not included in the inventory within a time limit set by PHPA should be considered ineligible for export as part of the accumulated stock.

- export of the entire skin stocks from Indonesia should be done within a period of 12 months after being inventoried.

- in addition to the accumulated stocks, PHPA should set a total annual export quota for all other skins (wild-caught, ranched, born or bred in captivity).

- as proposed in the Management Plan, the total quota should be calculated to include the number of wild caught skins indicated in the management program (2,000 saltwater and 3,500 freshwater skins), plus an estimated number of ranched and captive-bred skins based on stock reports and expected production by farms and ranches each year.

- PHPA should undertake to the CITES Secretariat to ensure that all export documents will distinguish the specific source of the skins (wild, ranched or bred in captivity). In addition all skins derived from accumulated stocks should be indicated as such on export documents.

2. PHPA should take action to ensure that the conditions of Decree No. 93/KPTS/DJ-VI/96 are strictly applied throughout Indonesia. Efforts should be made to ensure that all relevant PHPA staff are fully aware of the terms of this decree and that its implementation is closely monitored by PHPA headquarters in Jakarta. The principle of, "no reports, no exports" should be applied with vigour.

3. The wild population monitoring scheme should be initiated as a matter of urgency in each of the three management regions in Irian Jaya. Surveys conducted should be standardized and repeatable. The field results should be maintained in a retrievable form to allow scientific review.

4. The wild harvest quotas skins for Irian Jaya should not be increased until a comprehensive repeatable and standardized population monitoring program (as outlined in the Management Program) has been fully implemented and its results subjected to objective scrutiny.

The CSG Review Committee would like to thank in particular all the staff of PHPA and those members of the Indonesian Crocodile Farmers Association who personally and financially assisted to make the review, despite long working days and jet lag, a pleasant stay. Financial support which made the mission possible was graciously received by ACSUG. Thanks also to TRAFFIC and the German Government who each funded the participation of a member of the review team. -- *Extracted from CROCODILE MANAGEMENT IN INDONESIA- Summary Report of the IUCN/SSC Crocodile Specialist Group Review Committee's Third Mission 16 - 22 February 1997.* H. Messel, D. Jelden and S. Broad.

West Asia

Pakistan

COUNTRY REPORT. [This is the first section of an extensive, detailed report on the West Asia region. The remainder will appear in subsequent Newsletters.-- *Eds.*]. Alleem Chaudhury reports that the situation in Pakistan is not very encouraging, but at least is stable. Only one viable population of *C. palustris* exists in Sind province in the Deh Akro Wildlife Sanctuary, Nawshaba District. This area was was listed with high priority for World Bank GEF funding but was not included in final funding. Scattered muggers are found in more than 30 seepage lagoons along the right bank of the Nara Canal, an old riverbed fed by the Indus river through the Sukkur barrage. This population may be on the increase as young ones are often sighted.

Isolated populations occur in Baluchistan province but muggers are extinct in the Punjab and North West Frontier region. A small population inhabits the Haleji reservoir in Thaltas District. In Baluchistan a small population occurs in the Hingol National Park. The population size is unknown but this protected area has been selected for World Bank GEF funding and is currently being surveyed.

There are four captive breeding facilities in Pakistan, two each in Sind and Punjab. *C. palustris* are breeding in the Khar Wildlife Breeding center in Kirthar National Park and in Haleji Center in Sind. A private farm was recently established in Karachi but development has been slow. Two facilities in Punjab are Joccyanwala run by the Punjab Wildlife Department and Gatwala near Faisalabad managed by the Punjab Wildlife Research Institute. Egg laying was recorded by the single female at Joccyanwala and 20 hatchlings were obtained and kept for a year, but were transfered to the Faisalabad center and did not survive. The Faisalabad center holds 4 adults and 6 subadults and it is hoped these will start breeding soon.

Chaudhury reported that the gharial is long extinct in Pakistan. Ten young gharials were shipped from India to the Punjab Wildlife Department in the late 80's but only two survive in the Lahore Zoo.

For the future, the cost of 300 *C. palustris* of 1.5 m TL is reported to have been paid by the Punjab Wildlife Department in 1986-87 to the Government of India but the animals have not been delivered. The rearing facilities constructed for these muggers in Peshawar are deteriorating as they remain unused. The assistance of the CSG is requested in expediting this transfer to boost crocodile propagation in Pakistan. Chaudhury has also suggested that CSG could be more effective if scientific information exchange was improved and capacity building and staff training activities could be developed. He has requested the regional CSG representatives to look into this possibility, including finding a consultant, preferably from India, to advise in program development.

Another CSG member, Ashiq Ahmad, confirms reports of the situation in Sind and feels the situation there is improving, but that it is deteriorating in Baluchistan. Effective measures against poaching are employed in Sind but are not adequate in Baluchistan. The GEF project for Hingol National Park will provide a beginning for crocodile conservation in that region. All the Pakistan members note that the Newsletter is their only contact with CSG and strongly endorse the need for regional level meetings to develop crocodile conservation strategies. -- *submitted by* Rom Whitaker & Harry Andrews, *Madras Crocodile Trust, Post bag 4, Mammalapuram TN, India.*

LATIN AMERICA

Belize

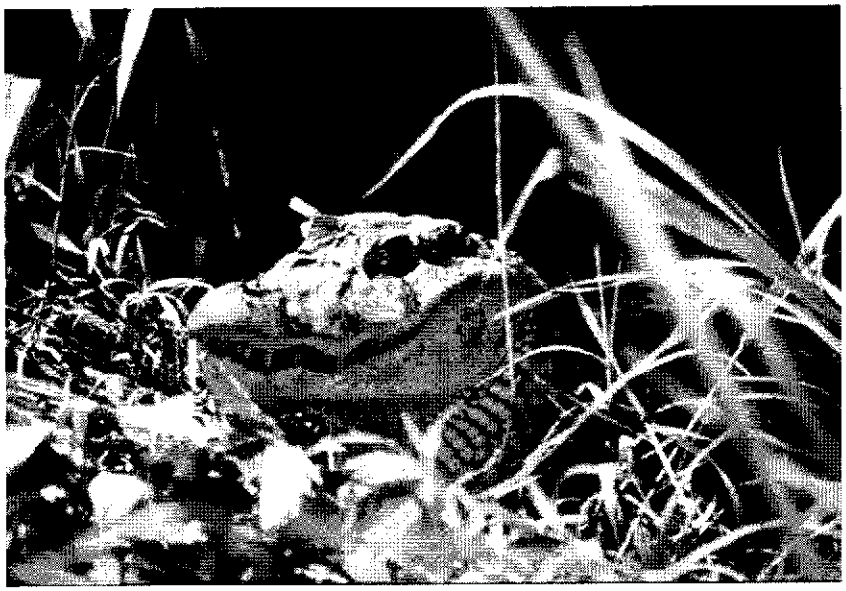
CONTAMINANTS IN MORELET'S CROCODILE EGGS. This study was initiated in July 1995 as part of ongoing research concerning the ecology and

status of Morelet's crocodile (*Crocodylus moreletii*) in Belize. Thirty one non-viable crocodile eggs were collected from three lagoons in northern Belize for contaminant analysis. Twelve eggs were collected from Gold Button Lagoon in the Orange Walk district. Located on a private cattle ranch (Gold Button Ranch), this lagoon supports one of the largest and least disturbed Morelet's crocodile populations in Belize. Three eggs were collected from Laguna Seca, located on a private farm (Gallon Jug Farm) in the Orange Walk district. Sixteen eggs were collected from Sapote Lagoon approximately 2 km north of San Narisco village in the Corozal district. Sapote Lagoon is included as part of the Ramonal and Sapote Agricultural Reserve. Eggs were collected from nests found on small islands associated with these lagoons.

Detectable levels of mercury and *p,p'*-DDE, a breakdown product of the pesticide DDT, were found in eggs from all three lagoons. Other DDT metabolites, *p,p'*-DDD, *p,p'*-DDT and heptachlor epoxide (a breakdown product of the pesticide heptachlor) were found in eggs from Gold Button Lagoon and Sapote lagoon but not Laguna Seca. Based on a limited sample, these results suggest that Morelet's crocodiles are being exposed to heavy metals and organochlorine contaminants in these lagoons. Additional research is continuing to further examine exposure of Morelet's crocodiles to environmental contaminants in these and other areas of Belize and to determine the potential impacts of these chemicals on crocodile populations. -- Thomas R. Rainwater, Scott T. McMurray, Tim A Bargar, George P. Cobb, *Dept. of Environmental Toxicology, Clemson University, Pendleton SC 29670 USA, &* Steven G. Platt, *Wildlife Conservation Society and Marine Research Center, University College of Belize, Belize City, Belize.*

Brazil

BLACK CAIMAN IN BRAZIL. Ronis da Silveira is living in a crocodilian biologist's paradise, on a floating house (with his wife and invaluable project assistant Barbara), in the middle of the 1.1 million ha Mamirauá Sustainable Development Reserve, on a lake chock full of black caiman.



Female *Melanosuchus niger* at nest. Caño Piri, Mamirauá, Brazil, J. Thorbjarnarson WCS. photo.

Ronis has a number of black caiman (and 1 spectacled caiman) equipped with radio transmitters and is also keeping busy conducting census work and mark-recapture studies.

When I was in Mamiraua in August 1996, Ronis noosed a 4 m black caiman (from a 4.6 m canoe) and we dragged it several kilometers back to our floating house base to place a radio-transmitter on its tail. I was also in Mamiraua in November-December assisting Ronis with caiman nesting studies. Working with a number of local assistants we were able to find nearly 100 nests during a relatively short period of time, 80 of which were made by *Melanosuchus*. Black caiman are nesting along the edges of lakes in the varzea forest, lakes that are buffered from the early rise of the Amazon River, which seems to be important in reducing the probability of nest flooding. In optimal areas (small lakes mostly covered with floating vegetation) we were finding 10-14 nests. The lakes are not easy to reach, but

once you are there the nests can be spotted by slowly paddling along the shoreline. It turns out that spectacled caiman nests are much harder to find as they move further from the edges of lakes and streams to lay their eggs.

One of the principal egg predators for both species are jaguars, and the big cats also take adult female spectacled caiman that are out in the forest nesting. We implanted 20 nests with HOBOTEMP temperature data-loggers and have found a number of interesting patterns in temperature regimes when comparing forest nests versus those on floating mats of vegetation. Barbara has become an expert at radio-tracking caiman, has taken charge of organizing the data, and has now experienced feeding the piranas with her fingers.

The illegal hunting of caiman for meat in the Mamiraua area appears to have been curtailed somewhat this year by increased enforcement activities by IBAMA and the Federal Police. -- John Thorbjarnarson, *Wildlife Conservation Society, 185th St and Southern Blvd., Bronx NY 10460, USA.*

Colombia.

REINTRODUCTION OF *C. ACUTUS*. In the town of Villanueva in Cesar a specimen of *C. acutus* originally obtained from Caño Lagarto has been kept for seven years. This specimen was in perfect condition, but the size of her enclosure was becoming inapproriate for her increasing length, and she was eating a great deal of food. For these reasons it was decided to return the animal to its original location and to monitor its adaptation to the local conditions, and particularly interactions with the resident population of crocodiles there. The specimen was a female of 188 cm TL and a weight of 30.5 kg. Additional detailed measurements were recorded and the animal was liberated in Caño Lagarto at 17.30 hours 4 August 1996. The animal was not specially marked for identification because it was easy to recognize her due to the lack of double caudal crest scales on her right side. The crocodile was liberated under conditions of low abundance of natural food, at a time of the year when lowering levels of dissolved oxygen cause mass mortality of fish in the caño. These factors have diminished for the moment.

The released female was sighted again on 14 August, a short distance from the release point. Her capacity for movement due to being held in captivity was normal and her behaviour towards other females in the population appeared to be extremely cautious. There appeared to be no signs of intra-specific aggression and the released animal submerged immediately on coming into view of other females in her vicinity. -- Gerardo Abadia Klinge, *Santa Fe de Bogota, Colombia.*

Cuba

NATIONAL WORKSHOP ON MANAGEMENT IN CAPTIVITY AND CONSERVATION OF CROCODILES. Between 4 and 9 January the first National Workshop on Crocodiles was held at the de Minas Crocodile Farm in Camaguey under the auspices of the National Crocodile Program, Empresa National para la Conservacion de la Flora y la Fauna (ENCFF). The workshop objectives were to report positive experiences in captive raising of crocodiles; develop a uniform information and statistical system for all the crocodile farms in the country; to present and discuss research undertaken by our crocodile specialists; to develop a round table on mass management of crocodiles in captivity; to undertake a practical demonstration of the control of stock movements in a farm; to establish directions for administration and management of financial resources in order to analyse the cost of production in different farms with the goal of developing a national strategy for the economic management of captive breeding and to analyse the recommendations of CSG-AZA-CITES experts Perran Ross and Bill McMahan presented after their visit in September 1996.

The workshop included biologists, vets and technicians from every crocodile farm in the country and the National Zoo as well as several directors of territorial and local flora and fauna protection personnel in the crocodile program. The workshop was organized by Lic. Pedro A. Rodriguez Hernandez, chief of the Herpetology Program ENCFF, and included the valuable presence of our colleague Roberto Toby Ramos, Dean of the Cuban crocodile workers.

On the first day (5 February 1997) we discussed aspects of stategy for adminstration and economic management and adopted a uniform system of information reporting for crocodile farms. We also discussed the recommendations of Ross and McMahan. The second day was dedicated to the presentation of research results of farm specialists in the following seven themes:

Reproduction of *Crocodylus rhombifer* achievements and deficiencies (Lic. Migda Mendez, Cayo Potrero Crocodile Farm, Isla de Juventud); Dietary parameters of *C. acutus* in their first year (Lic. Annamarys Miranda, Moron Crocodile Farm, Ciego de Avila Provincc); Patterns of behaviour in mating and nesting of wild *C. acutus*. (Lic Manuel Alonso Tabet, Jobabo Farm, las Tunas.); Nutritional developments in *C. acutus* in captivity (Dr. Alexis Hernandez, Minas Farm, Camaguey); Care and feeding of hatchling *C. acutus* (Lic. Gabriel Cisneros, Birama Farm, Granma); Patterns of feeding in *C. acutus* in captivity (Lic. Norbert Fonseca and Dr. Roderigo Benavides, Manzanillo farm, Granma); Observations and counts of *C. acutus* in the Rio Maximo Fauna Refuge (Lic. Jose Maorales, Rio Maximo Refuge, Camaguey). During the third day we listened to a masterful presentation by Toby Ramos on his work and in the afternoon we conducted a round table discussion on practical aspects of captive raising of crocodiles.

The fourth day was spent in practical demonstrations of techniques of capture and handling of crocodiles, and the fifth and last day was spent developing conclusions and recommendations and in a closing party. We consider this workshop to have been a success. We were able to complete our objectives of coordinating working criteria and comparing experiences, giving rise to a new stage of better organization in the management and control of the mass of crocodiles in captivity and establishing bases for the perfecting of legislation applied to the management, conservation and control of crocodiles in Cuba. -- Roberto Rodriguez Soberon, *Proyecto Cocodrilo, Empressa Nacional para la Conservacion de la Flora y la Fauna, Ministeria de Agricultura, Havana, Cuba.*

Costa Rica

PROGRAMA DE REPOBLACION DE *CROCODYLUS ACUTUS* EN EL RIO MOROTE, GUANACASTE, COSTA RICA. El pasado 5 de Junio, el proyecto 'Manejo sostenido del cocodrilo (*Crocodylus acutus*) y del caiman (*Caiman crocodilus fuscus*)', realizo la liberacion dc 34 ejemplares de cocodrilo de un ano de edad, con el cual se cumple en parte con el objetivo de realizar liberaciones periodicas en areas donde las poblaciones naturales se han visto disminuidas. En esta actividad participaron miembros de la Municipalidad de Nandayure, de Asociaciones Conservacionistas, Escolares y Colegiales y habitantes de esta comunidad asi como representantes del Ministerio de Ambiente y Energia (MINAE); los cuales demonstraron gran interes en la proteccion y conservacion de este importante recurso con el que cuentan. En el rio Morote, ubicado en el canton de Nandayure, provincia de Guanacaste, en los ultimos 6 anos, se ha visto una disminucion gradual principalmente del numero de adultos reproductores, lo cual disminuye enormemente el potencial reproductivo de esta especie. La deforestacion en las areas aledanas a los rios, la matanza indiscriminada de adultos por representar un peligro para el ganado y las poblaciones humanas, y la falta de sitios adecuadas para que el ganado tome agua y no se introduzca a las zonas de anidamiento del cocodrilo, son las principales causas de la disminucion de estas poblaciones. Se libero el 20% de los cocodrilos que nacieron dentro de nuestras instalaciones, de huevos colectados en areas naturales pero incubados artificialmente. De los individuos liberados un % fueron hembras y el resto machos para una relación de 3:1 en favor de las hembras. El tamano promedio de los individuos liberados fue de 49.07 cm y su peso de 494 g. A esta poblacion se le realizar n monitoreos periodicos y estudios que ayuden a establecer el exito y viabilidad dc este programa. -- Juan R. Bolanos Montero, Juan Jose Sanchez Ramirez y Lilliana Piedra Castro, *Laboratorio de Manglares. Escuela de Ciencias Biológicas. Universidad Nacional. Costa Rica. Email: jbolanos@irazu.una.ac.cr*
lpiedra@irazu.una.ac.cr

Free translation of the preceding article. On the 5th of June 1996, our project 'Sustainable management of Crocodiles and Caimans', liberated 34 specimens of *Crocodylus acutus* of one years age, as part of our program to periodically release animals in areas where the natural population is diminished. Participants in this activity included representatives of the Municipality of Nandayure and the Association of Conservationists. students, local community members and representatives of the Ministry of Environment and Energy, who have demonstrated great interest in the protection and conservation of this important natural resource.

The Morote river is found in the canton of Nandayure in Guanacaste (NW Costa Rica) and over the last 6 years has seen a gradual reduction,

primarily in the number of reproductive adult *C. acutus*, which has greatly reduced the reproductive potential of this population. Deforestation of areas along the river, indiscriminate killing of larger crocodiles which are seen to be a danger to stock and people, and the lack of adequate areas for cattle to water, leading to disturbance of crocodile nesting areas, are the principal causes of population decline.

We have liberated 20% of the crocodile born in our installation from eggs collected in natural areas but incubated artificially. The animals liberated had a sex ratio of 3 females: 1 male, an average length of 49.07 cm and an average weight of 494 g. This population will be monitored periodically and studied to evaluate the success and viability of this program.

French Guyana

SALT WATER CAIMAN. The black caiman, *Melanosuchus niger*, is not reported in the literature to live in brackish or salt water. However, I noticed, and reported several years ago, that black caiman could be found relatively close to the sea in French Guyana. In November 1996, I met Vincent Priou, a young man who has started to make surveys of black caimans in French Guyana and has created an association for caiman conservation. Vincent has made similar observations and so we arranged to survey the lower Kaw river together, down to the sea. We did so and found young *M. niger* of 1.2 m and 1.6 m TL at the river mouth. We measured the salinity and found it to be 11.9 -23.5 parts per thousand (i.e. one third- two thirds seawater) at high tide. We still do not know if the animals naturally prefer this habitat or if they are there because of habitat disturbance and former hunting in the more suitable fresh water habitat upstream. -- Olivier Behra, *8 rue au Maire, Paris, France*.

Black Caiman *M. niger* juvenile, Kaw river estuary. M. Blanc photo

Guatemala

A NEW RECORDED LOCALITY AND INFORMATION ON MORELET'S CROCODILE. Morelet's crocodile is a species with restricted distribution along the flooded margins of the north Caribbean from Tamaulipas through the Yucatan peninsula of Mexico and the Peten of Guatemala and Belize. However, knowledge about these limits of distribution remain uncertain, and in some cases questionable, due to the confusion between this species and *C. acutus*.

This report is based on a discovery in the region of San Francisco del Mar, Manabique, Department of Izabal in coastal Guatemala where only *Crocodylus acutus* has been reported. We have determined the size and taxonomy of a crocodile specimen by considering cranial morphology. The study area was characterized during field visits and interviews with fishermen assisted in locating crocodile specimens. For species determination we used the criteria of Stuart 1964 and Schmidt 1924 and to determine size we used the procedure established by Magnusson 1982, Chabreck 1963 and Lara 1990.

The study area is the San Francisco River near the town of Puerto Barrios in Izabal Department. The river originates southeast of the Bahia Santo Tomás de Castilla and from there through the district of Entre Rios, running northwest to south east and discharging into the Gulf of Honduras at 15° 49'36"N, 88° 23'22" W. The river is approximately 98 km long and has a valley subject to flooding..

The specimen for this study was recovered from a fishing net set at night in the lower reaches of the river. The fishermen recovered the net the following day and found the crocodile dead. In this case we only recovered the skull and the length was estimated.

The cranium collected was 43.0 cm from the orbit to the nares, 19 cm in width at the level of the tenth maxillar tooth and 20.5 cm from the base of the tenth maxillar tooth to the extreme snout tip. Applying the criteria of Schmidt and Stuart, the snout width is greater than 3/4 of the snout length (as measured) corresponding to *Crocodylus moreletii*. The length of the specimen, calculated from a regression equation based on skull and total lengths of 49 specimens reported by Lara 1990 indicated a specimen of approximately 4.25 meters total length. which is greater than previously recorded for this species.

These results have important implications in understanding the limits of distribution of *C. moreletii* indicating a range extending further south than previously recorded, and opening the strong possibility that *moreletii* may also occur in Honduras, which is only 15 km from the locality. On the other hand, the observation opens a series of questions about the ecology of the species and possible sympatric distribution with *C. acutus*. The area of study is of special interest as it will be declared an area for wildlife protection due to its high biological diversity and small alteration of ecosystems. The estimated size of this specimen also suggests that this system has been little altered which has permitted a specimen to achieve this large size. -- *Translated and summarized from a longer report by* O. F. Lara, L. Rosales, B. Chavez y F Catañeda, *Escuela de Biologia, Universidad de San Carlos de Guatemala, Tegucigalpa, Guatemala.*

NORTH AMERICA

United States

SOUTH CAROLINA ALLIGATOR REPORT. The South Carolina (SC) Alligator Program was established in 1988 in response to alligator population recovery and mushrooming urban development on the coast. The SC Department of Natural Resources (DNR) was confronted with increasing alligator human conflicts that needed attention. Resolving nuisance alligator complaints was the main focus of the program but gradually the program grew to include information dissemination, population surveys and research. Following federal and State approval, the first SC alligator season in 31 years was implemented in 1995. The program is currently staffed by one project Supervisor and this annual report documents the work conducted by the program.

During 1996, 23 talks were given to 1,594 people including civic, community and student groups. Further, 18 media interviews and three news releases were completed. A marketing permit is required for anyone wishing to market alligator products in SC. A total of 58 permits were issued in 1996 and businesses inspected periodically. Permits are also issued for alligator possession for educational, scientific and zoological purposes and 7 new permits were issued bringing the total number of people permitted to possess alligators to 18, which includes several state parks and non-profit nature centers.

The nuisance alligator program consists of four contracted alligator trappers. Alligator complaints are coordinated by regional DNR biologists who review incoming calls and issue permits for the trapper to remove the animal. The trapper has 45 days to fulfill the permit and is responsible for skinning and butchering the alligator. Skins are turned over to the State and sold and each trapper received 85% of the value of his skins. The remaining funds are split between the SCDNR and the consultant who sells the skins. Trappers retain all the income generated from meat and other parts sales. In 1996, 786 complaints were received and 358 removal permits issued. The number of complaints has increased by 43% since the program began in 1988 representing an increase of 4.1% annually. A total of 238 alligators were harvested (i.e. about 46% of complaints and 66% of permits issued). Average size of harvested alligators was 233.8 cm (7' 8") and generated an average price of $37.54 per linear foot (30.5 cm). The program generated $5,188 in state revenue. The increase in complaints is associated with spreading urban centers and is likely to continue.

The fall of 1995 was the first time for three decades alligators could be legally harvested from the wild in South Carolina. Interested landowners with 100 acres or more of occupied alligator habitat apply for a quota. A quota is established for each applicant property based on habitat inventories and spotlight surveys conducted by the project supervisor and DNR staff. Alligators can be hunted only from mid-September to mid-October and must be captured alive and then killed and tagged immediately. The tagged hides are inspected and validated by SCDNR within two weeks of the season's end and then the owner is free to market them. All parts must carry a tag.

The program was expanded in 1996 and 16 permits were issued. One hundred and sixty eight tags were issued and 128 alligators harvested with a success rate of 77%. The average size of alligators harvested was 211.2 cm (6' 11") with a maximum of 370.8 cm (12' 2") male and 254 cm (8' 4") female respectively. The program generated $6, 695 in state revenue.

Alligator research is conducted as funding permits and when specific questions need addressing. Three projects were conducted in 1996. Research on temperature dependent sex determination continued for a third season in collaboration with Jeff Lang, limited mercury analysis on meat was completed and DNA investigations were initiated.

Thirty five nests were located in aerial surveys on the Santee Coastal Reserve and temperature probes placed in 28 active nests. Following the TSD period, 1,196 eggs were collected and incubated and 621 hatchlings sexed with a sex ratio of 75% female. An additional eight nests were instrumented and monitored on Kiawah Island with assistance from local residents and volunteers. The sex ratio in the maritime forest was 70.4% females.

Mercury contamination of alligator meat has long been a concern, especially now that every river in SC has warnings about consumption of fish because of mercury levels. A limited sample of meat from nuisance alligators were tested and several found to be above US FDA recommended levels. Further testing is recommended.

Status, distribution and trends of alligator populations are monitored annually by aerial nest surveys and night light surveys. Surveys are regularly conducted on nine representative areas twice a year. In 1996, 72% of the routes were surveyed and indicate that overall, the general population trend of animals over 122 cm size class is stable or slightly increasing. Manpower restrictions and weather are the main causes of incomplete surveys, but selected spotlight surveys appear to be adequate for monitoring population trends. Overall, the Alligator project has effectively handled nuisance alligator complaints, successfully implemented a wild harvest, continues to produce quality research and has continued to provide information to the public. -- *Summarized from 1996 Annual Report, South Carolina Alligator Program.* Walt Rhodes, *Project Supervisor, Wildlife Management Section SC DNR, P.O. Drawer 190, Bonneau, SC 29431 USA.*

PUBLICATIONS

CROCODILES. PROCEEDINGS OF THE 13TH WORKING MEETING OF THE CROCODILE SPECIALIST GROUP. Proceedings of the meeting held in Santa Fe, Argentina, May 1996, have been mailed to registered participants. A small number of copies are available for general sale. The cost is $35, which includes mailing costs. Checks or money orders in US dollars must accompany orders which should be sent to -- Alejandro Larriera, *Bv. Pellegrini 3100, Santa Fe 3000, Argentina.*

RESEARCH

DO CROCODILE HATCHLINGS IMPRINT ON THEIR PARENTS? In most bird species the chicks imprint on their parents after hatch and subsequently are able to recognize their parents and later in life choose a sexual partner according to the imprinted image. Ostrich chicks in nature are never left alone by their parents. When hatched artificially, they imprint on humans and subsequently suffer from severe stress, when they are frequently left alone, deserted, by their adopted parents. This stress leads to behavioral disturbances and appears to be responsible for a large proportion of mortality in intensively reared ostrich chicks (Huchzermeyer 1997). Stress also leads to an increased susceptibility to otherwise harmless infectious agents.

Crocodiles are the only reptiles which exercise parental care similar to birds. Artificially incubated hatchlings are also known to be very susceptible to infections. Often they are heard on farms calling their mother when disturbed. They accept the presence of the person cleaning the pen and feeding them, while being frightened by the approach of other persons.

On many crocodile farms in South Africa low (15-20 cm) table-like shelters are placed in the hatchling pens and have been found to have a quieting influence on the hatchlings. If they feel threatened, they do not call, but run towards the shelter and take cover. In complete darkness they also call for their mother, but when sufficient light

is left on for them to see the shelter, they are quiet and appear to be content. In birds the imprinting process stretches over a prolonged period of exposure. On crocodile farms the exposure of the hatchlings to humans is minimal. Preferably the animals are left alone as much as possible. I cannot imagine the hatchling-mother interaction in crocodiles to be possible without imprinting. A low, short-legged shelter in an otherwise featureless rearing pen could very well serve as mother image for such an imprinting process. A simultaneous or alternative imprinting on a person present for at least part of the day also seems feasible.

If providing a mother image and the implicit feeling of security reduces the stress in artificially reared crocodile hatchlings, it could become a major improvement in our farm management practices. I have worried for a long time about how to set up experiments to prove the imprinting process, but now I believe that the shelters are already half of the proof. I have used the term crocodile loosely, intended to embrace all crocodilian species. Reference: F. W. Huchzermeyer 1997, Behavioural problems in farmed birds. British Domesticated Ostrich Association Ostrich News, 4 (1): 17-21. -- Fritz Huchzermeyer, *P O Box 12499, Onderstepoort, 0110, South Africa.*

EFFECT OF TEMPERATURE ON SEX DETERMINATION IN *C. ACUTUS* AND *C. MORELETII*. To examine the effects of incubation temperature on *C. acutus* and *C. moreletii* we used fertile eggs incubated at 30°C, 32°C and 34°C (maintained within 0.5°C) and a humidity of 95% using vermiculite as a substrate. In the first phase, embryos were sacrificed at different times during development. The structure of the gonad was observed with high resolution microscopy. In the second phase, hatchlings were hatched and seven days after hatching the gonad was evaluated by the same method.

In the results of our sample, in *C. acutus* 30° and 34° produced 100% females and 32° produced males and females (50%: 50%). For *C. moreletii* we obtained 100% males at 34° and 100% females at 30° and 32°. We conclude that the ratio of sexes is a function of temperature in both species, but the actual response to incubation temperature differs for *C. acutus* and *C. moreletii*. Additional investigations on the mechanisms of this effect was conducted by examining steroidogenesis by histochemical techniques in the urogenital complex. The metabolism of sexual steroids was found to be responsive to temperature and different in the two species. -- *Summarized and translated from* Xochitl Aquilar Miguel. *1995. Effecto de la temperatura de incubación sobre la determinacion del sexo en Crocodylus acutus y C. moreletii. Biol. Soc. Herpetol. Mex. Vol 6(2):43.*

TRADE

CONCERN OVER AMERICAN ALLIGATOR SKIN PITTING. I would like to present an observation on a condition occuring in alligator skins and request that those involved with the biology and trade of crocodilians examine this issue. I have observed pits in alligator skins which are not evident on the scale, but erode the tissue below. These range from superficial dermal inclusions to deep subdermal pits that in some cases go through the shaved and processed skin. I have seen skins with as few as one of these pits to many that have hundreds (see figure). The pits are undetectable until the scales have been removed in the beaming operation during tanning. As a result it presents quite an economic and trade concern as hides bought as number ones will turn out to be much lower grades upon tanning. It seems, in my opinion, that this condition, which I have noticed casually to a lesser extent over the past 10 years, has increased enormously in the last two or three years.

The cause is unknown but my first guess, and one I feel most strongly, is that these pits may be from a parasite similar to those found in crocodiles, such as *Paratrichosoma crocodilus*, only this parasite bores directly through the skin instead of meandering in a serpentine manner as in *Paratrichosoma*. Other possibilities suggested are latent effects of *Dermatopholis* virus similar to the scars left by small pox in humans. Still another conjecture is the pits are due to protolytic degradation from bacterial action due to an extended time from harvest to processing the animal and curing the hide. It is possible that this condition is indicative of a negative factor in the alligator's environment.

I have noticed this condition from a lesser to a greater extent in skins from both brackish and fresh water, farmed and wild skins and in skins from all producing States. I feel that we are at a stage of extreme negative biological, economical and trade ramification with this condition and hopefully this article will initiate discussion and research into these observations.

I suggest that we collect tag numbers from crust and finished skins which posses the condition as a first step to indentifying origins and causes. In the short term, we in the trade must determine a way to recognize this condition in raw skins and grade accordingly to protect the grade quality of US alligator skins. -- David Haire, *121 Zebulon St., Milner, GA 30257, USA.*

Alligator mississippiensis skin showing pits and holes. D. Haire photo

SIEZED YACARE SKINS IN BELGIUM. In 1989 the Belgian CITES Management Authority siezed around 7,000 crusted skins of *Caiman crocodilus yacare* imported from Argentina and presumed to have originated from Paraguay. After several years litigation, the prosecution of this case has ended and the skins are now the property of the Belgian government. The CITES Secretariat has requested the Belgian authorities to proceed with a public auction of these skins and to donate the net proceeds of the auction to the Secretariat to use in Caiman conservation projects in the Latin American region.

The Belgian authority has indicated willingness to put the skins to auction and to do so they need to sort and grade the skins for sale. The Secretariat has been able to arrange with the Syndicat des Tanneurs Francais to assist with this and CSG member Mr. Philippe Roggwiller is ready to send an expert to Belgium to proceed with this inventory. The CITES Secretariat requested input from CSG on this process and in a letter to the Secretariat the Executive Officer, with the approval of the CSG Chairman, has said:

"While we are always cautious to ensure that such transactions are conducted to the absolute letter of the law and CITES, and do not serve as an incentive to promote additional illegal trade, in the present circumstances, the proposed disposal appears to us both practical and beneficial.

As you are aware similar disposals have been conducted with success in the past, and the use of the funds generated to promote conservation and sustainable use of caimans in Latin America ensures that the overall effect will be to the nett advantage of the species. There is certainly a continuing need for funding of conservation action for crocodilians in the region. We are also pleased that our CSG member Mr. Roggwiller is able to assist you and the Belgian authorities in this matter. We would only caution that if the skins leave Belgium after sale, they will need to be accompanied by the appropriate re-export permits and tags, but we are confident that you and the Belgian authorities will have anticipated this need. We presume also that the original illegal exporter would not be eligible to bid on the skins, and perhaps regain control of them at an advantageous price, but this is a detail we leave to the Belgians to handle as they see fit. Overall then we see this as a sensible solution to the issue and I am pleased to give it our full support." -- *Editors from correspondence. with the CITES Secretariat.*

MEETINGS

PRELIMINARY ANNOUNCEMENT, 14TH WORKING MEETING OF THE CROCODILE SPECIALIST GROUP, SINGAPORE, JULY 1998. The Singapore Reptile Skin Trade Association have confirmed their offer to host the 14th Working Meeting in Singapore. A meeting of the Association will be held in April 1997 to discuss suitable dates, with the week of 13- 17 July 1998 under consideration. Detailed information, registration information and calls for papers will be announced in the Newsletter.

REGIONAL MEETING OF THE CSG FOR CENTRAL AMERICA AND THE CARIBBEAN. Villahermosa, Tabasco, Mexico, 4-7 August 1997. The meeting organizers under the leadership of the Society for the Study and Conservation of Mexican Crocodilians (SECOCOM) have sent invitations to a large section of CSG members in the Region and is receiving preliminary registration forms. Inquiries should be addressed to: Biol. Beatriz Figueroa Ocaña, Universidad Juarez Autonoma de Tabasco, Av. Universidad S/N, Zona de Cultura, Villahermosa, Tabasco, Mexico. Tel **529 354 4308 Fax: 529 354 4308/354 1470** E-mail: cicea@ujat3.ujat.mx

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REGIONAL MEETING FOR INDIA/WESTERN ASIA. CSG members and crocodile experts from India, Pakistan, Nepal, Bangladesh, Burma and Sri Lanka will convene at Jiwaji University, Gwalior, India 5-7 June 1997 to discuss regional issues. Funding for the meeting was obtained by the Madras Crocodile Bank from the Peoples Trust for Endangered Species UK. Inquiries may be directed to R. Whitaker and H. Andrews, *Center for Herpetology, madras Crocodile Bank, Post Bag No. 4, Mammalapuram, TN 603 104 India*

SYMPOSIUM ON CROCODILE ECOLOGY AND EVOLUTION. Planning stages are underway for a symposium/conference/workshop (depending on attendance) on Crocodile Ecology/Evolution to be held independently of the CSG meeting next year. Topics will include paleontology, biogeography, molecular systematics, functional morphology and biomechanics, population ecology, and physiological ecology. We anticipate attracting some 100-200? individuals will result in 40-50? presented papers over a span of 3 days or so. Timing will be so that those interested in attending the CSG meeting (in Singapore) are able to visit Brisbane for the meeting beforehand. Tentatively scheduled for 6-10 July 1998. We envision a meeting of those interested in more scientific aspects and intend to publish the proceedings. Organizers are coordinating with CSG to ensure the meeting complements the 14th Working Meeting of CSG. -- Professor Gordon Grigg, *Dept. of Zoology, University of Queensland, Brisbane, Australia.*

THIRD INTERNATIONAL CONGRESS ON WILDLIFE MANAGEMENT IN AMAZONIA, 3-7 DECEMBER 1997. SANTA CRUZ, BOLIVIA. The Congress will focus attention on wildlife management applied in the Amazon region. Preliminary discussions are underway to include a workshop on management of Amazonian crocodilians at the Congress. Inquiries and registration information can be requested from -- *Tropical Conservation and Development Program, Center for Latin American Studies, University of Florida, P.O. Box 115531, Gainesville FL 32611 USA, Fax: 1 352 392 0085, E-mail*: tcd@tcd.ufl.edu

CSG ON-LINE

NEW HOME FOR CROCODILE LINK. One of the most useful and often visited crocodile websites is Adam Britton's 'Crocodile Natural History and Conservation'. Adam is graduate student approaching completion of his PhD. degree who placed his pages through his University connection in Bristol, which will soon end. As a service to users CSG and the Florida Museum of Natural History, University of Florida, have agreed to provide this useful page with a home. This page will continue to be managed by Adam and can be found at http://www.flmnh.ufl.edu/natsci/herpetology/brittoncrocs/cnhc.html. Check it out for the new crocodile sound library.

CSG ON DISCOVERY CHANNEL. The CSG Executive Officer was invited by the educational 'Discovery' TV Channel to serve as their on-line respondent March 30 - April 5, to answer questions posted to their 'Discovery Wired' section. Discovery features a science or wildlife

documentary each week and viewers can send in questions via the web to be answered by an on-line expert. See http://eagle.online.discovery.com/cgi-bin/forums_view/dir/Wild%20Discovery%20Wired/Crocodiles.

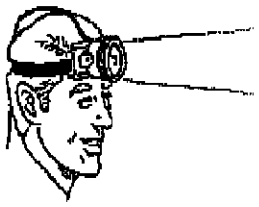
MISCELLANEOUS. See Mr. Pit's homepage for pictures and an account of the capture of the notorious maneating crocodile of Sarawak, the Bujang Senang, at <http://www.geocities.com/Heartland/3409/>.

The new journal Amphibian and Reptile Conservation has a web site at <http://www.byu.edu/~arcon/>.

Florida Game and Freshwater Fish Commission has opened a home page at <fcn.state.fl.us/gfc/gfchome.html>. Alligator regulations are accessible from this page.

The Herpetological Index 1996 is a compendium of herpetoligical publications prepared by Breck Bartholomew at Bibliomania, Logan , Utah and is accessible on the web at <http://www.sisna.com/users/Herpbooks/Contents.html>.

PERSONALS



Alberto Yanosky will continue as Director of Research and Valuation of Natural Resources within Fundacion Moises Bertoni for the Conservation of Nature in Paraguay. Fieldwork with caimans continues mainly within the Private Nature Reserve Program. Caimans are censused for wildlife inventories and monitoring and operations with caimans are being promoted as future sources of income as a way of valuing natural resources. My email address is <AYANOSKY@FMBERT.UNA.PY>

Dr. Charles Santiapillai, *Dept. of Zoology, University pf Peradeniya, Peradeniya, Sri Lanka* writes; 'I am very keen to become a more active worker on crocodiles in Asia given my present position as Executive officer of the Asian Elephant Specialist Group as I have a number of opportunities to travel to countries where elephants (and crocodiles too) occur. I would be happy to assist your group. The CSG must become a key player in South and South east Asia. A window of opportunity may arise in Burma (Myanmar) where the present Forestry Ministry has been so helpful to the Elephant Group in initiating conservation programs. It would be worth initiating an update on the status of the crocodilians of Myanmar.'

Gustavo Hernadez, *Apdo 1998, Valencia, Carabobo, Venezuela,* (new address) informs us that he is now working with the support of the Wildlife Conservation Society and establishing a link with UNELLEZ, the University where Andres Eloy Seijas works. He will continue working with Orinoco crocodiles in Venezuela and expects to attend the Regional Meeting in Villahermosa, Mexico, in August.

Alison Leslie, *Crocodile Research, P.O. Box 6084, Uniedal, Stellenbosch 7612, Cape Province, South Africa*, has moved from St. Lucia Estuary in Natal. She continues to spend her time between South Africa and the USA and is writing up her results from several years research on Nile crocs at St. Lucia. An article for the Newsletter is promised [we will hold you to that Alison--*Eds.*].

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

Steering Committee of the Crocodile Specialist Group

Chairman: Professor Harry Messel, Executive Chancellor, Bond University, Australia.
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