

CROCODILE SPECIALIST GROUP

NEWSLETTER

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IUCN—The World Conservation Union
Species Survival Commission



Cover Photo: *Caiman crocodilus* from French Guyana eating a snake, *Liophis cobella*. M. Blanc photo, submitted by O. Behra.

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The CSG NEWSLETTER is produced in both printed and www editions by the Crocodile Specialist Group of the Species Survival Commission, IUCN - World Conservation Union. The NEWSLETTER provides information about crocodylians, their conservation, status, and management, and on the activities of the CSG. The hardcopy edition of the NEWSLETTER is distributed to CSG members and, upon request, to other interested individuals and organizations. We hope you find this www edition of use. All subscribers and users are asked to contribute news and other materials—see Editorial Policy below. As a professional courtesy, the sources of the news and information are identified throughout the NEWSLETTER. If you use any of the information provided in the NEWSLETTER, please continue that courtesy and cite the source. Subscribers who receive the printed edition of the NEWSLETTER are requested to make a voluntary contribution (suggested \$40.00 US per year) to defray expenses of publication and mailing. Comments concerning the NEWSLETTER or this www page should be addressed to the CSG Editorial Office: Dr. J.P. Ross, Executive Officer, Florida Museum of Natural History, Gainesville, FL 32611-7800, USA. Fax: 352 392 9367, Email: prosscsg@flmnh.ufl.edu

PATRONS

We gratefully express our thanks to the following patrons who have donated financial support to the CSG conservation activities and program.

Big Bull Crocs! (\$25,000 or more annually or in aggregate donations)

- Japan, JLIA—Japan Leather & Leather Goods Industries Association, CITES Promotion Committee & All Japan Reptile Skin and Leather Association, Tokyo, Japan.
- Mainland Holdings Ltd., Lae, Papua New Guinea.
- Utai Youngprapakorn, Samutprakan Crocodile Farm, Samutprakan, Thailand.
- Jacques Lewkowicz, France Croco, Paris, France.

Friends (\$3,000 - \$25,000)

- Heng Long Leather Co. Pte. Ltd., Singapore.
- Sharon R. & F. W. King, Gainesville, Florida, USA.
- Philippe Roggwiller, Tanneries des Cuirs d'Indochine et de Madagascar, Paris, France.
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- Frank Garcia, Criadero Especies del Caribe, Cartagena, Colombia.

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HONORS

GOLDEN ARC AWARD FOR PARAGUAY CITES EFFORTS.

H.R.H. Prince Bernhard of the Netherlands inducted Aida Luz (Lucy) Aquino into the Order of the Golden Ark with the rank of 'Knight.' Lucy received the award for services to conservation in pursuit of her work in implementing CITES in Paraguay in her capacity as Scientific Authority. Golden Ark appointments are awarded for outstanding services to conservation. Lucy is credited



with almost singlehandedly changing Paraguay from the largest single shipper of illegal wildlife in South America to a strong advocate of professional wildlife conservation and an active and effective participant in CITES. Despite initial opposition from traders, lack of support from government agencies and a difficult logistic situation, Lucy persevered to convince wildlife traders that adherence to CITES regulation and national law could eventually enhance their business. Under Lucy's direction Paraguay has established sustainable use programs for Tegu lizards (*Tupinambis* sp.) and a pilot program to reopen caiman harvest on a sustainable basis is in development. Lucy is also active in national parks development, technical training and remains active in herpetological field work with the National Museum of Natural History. She is a member of the CSG Steering Committee, active with TRAFFIC and the Paraguay coordinator of SSC's Declining Amphibian Population Task Force. The award recognises these valuable accomplishments and we join all her colleagues in offering our resounding congratulations for this well deserved honor.—Eds



STEERING COMMITTEE

CROCODILE SPECIALIST GROUP STEERING COMMITTEE
Minutes, 15 October 1996, Montreal

Present: H. Messel, R. Elsey, D. Ashley, J. Hutton, G. Webb, R. Jenkins, O. Behra, S. Broad, F.W. King, A. Larriera, P. Ross. Observers: D. Siswomartono (Indonesia), G. Cortez (Colombia), A. Imhof, (Argentina), A. Rosser (SSC Trade Program), E. Fernandez (Honduras).

The meeting opened at 9.10 am and the Executive Officer presented a financial report for January - September 1996. Revenues were \$61,885.66 in unrestricted donations, \$4,144 for special projects, \$2,592.31 for newsletter subscriptions and \$347.50 for sales of publications. Expenses for general operations totaled \$55,269.25 and special projects \$11,072.22. The current balance was \$38,215.94. It was hoped that additional donations received before the end of the year would allow us to start the next year with funds in hand for general operations expense for 1997. The amount of \$1,514.78 appearing in the report as bank charges was explained as the new administrative fee charged by the University of Florida to handle our account as announced in May (Steering Committee minutes).

Changes in the Steering Committee enacted on the recommendation of the May Steering Committee meeting were reported. Alejandro Larriera is Vice Chairman for Latin America and Dr. Choo Hoo Giam has joined Grahame Webb's Asian section. Lehr Brisbin will serve with Val Lance in the Science section and Bernardo Ortiz will be an ex-officio member representing IUCN. Steven Edwards has agreed that the SSC Sustainable Use Initiative has adequate representation through other CSG members and agreed to step down. Steven Broad has agreed to serve as Vice Chairman for Trade Monitoring and Lorrie Collins of WCMC will be join the Trade Monitoring section, allowing Richard Luxmore and Ginette Hemley to step down. Sergio Trachter has been inactive and may no longer be associated with the caiman trade. The Executive Officer will ask Vice Chairman for Trade, Kevin van Jaarsveldt for his recommendation.

The CSG membership will be reconstituted for the new triennium 1997-2000, following SSC practice. Vice Chairmen were invited to begin the process of nominating or re-nominating members and a simplified process for renewal outlined. The Executive Officer will provide lists of current members to the Vice Chairs who will recommend to the Chairman who should be renewed and any additional members nominated. The Executive Officer will then send out letters of invitation from the Chairman to nominated members who should confirm their acceptance directly to the Executive Officer. The Executive Office will then inform SSC and IUCN who has accepted membership. A CSG directory of members will be prepared and distributed. This process will be undertaken by early 1997. Discussion followed on whether CSG member addresses should be published on the CSG Homepage and it was concluded that they should not. Brief discussion followed on whether CSG membership should remain constant, further expanded or reduced. It was agreed that regional Vice Chairs may follow their own inclinations regarding who and how many members were appropriate for their region. The Chairman noted that there were fundraising advantages to having a broad membership and that an inclusive approach should be encouraged.

The Executive officer summarized discussions held at the SSC meeting describing the development of national and regional networks of SSC-Specialist Group members to coordinate conservation action at these levels. These national and regional networks will allow members of diverse specialist groups to interact and provide locally specific input to broad conservation and biodiversity issues. Development of the networks is well advanced in several South American countries and in West Africa and is progressing more slowly elsewhere. These networks follow the general tendency to decentralization currently underway in IUCN. To ensure that CSG remains in contact with national and regional issues we need to ensure that CSG members at these levels are put in contact with the developing networks. Grahame Webb mentioned the growing common interest of CSG and the Marine Turtle Specialist Group and recommended that a joint meeting to discuss issues be convened. The Executive Officer undertook to contact his opposite number in MTSG for this purpose.

The venue for the next (14th) Working meeting of the CSG was discussed. The Singapore Reptile Traders Association has renewed its offer to host the meeting in 1998 as long as the dates do not conflict with some regional trade events. Discussion was held concerning placing the meeting in India to address current conservation concerns there, or in Cuba. Concerns were expressed that accommodations in Singapore might exceed the financial resources of many members. The very successful travel and housing subsidy program provided by the organizers of the Argentina meeting was presented as a solution to this problem. After consideration of the different factors it was agreed that the Executive Officer should pursue the invitation with Singapore to clarify these issues and develop a concrete proposal for 1998.

Mexican Regional Meeting. Letters from the Mexican sponsors of the Regional CSG Meeting in 1997 were presented and the Chairman formally accepted their commitment to host the meeting and directed that detailed arrangements proceed. The meeting is proposed for 4-7 August 1997 in Villahermosa, Mexico. Invitations will be sent to all Central American and Caribbean CSG contacts and general announcement will go out with the next (Vol 15 (4) December) newsletter.

World Wildlife Fund airport promotions opposing wildlife use. A response from WWF to our letter was presented. The letter suggests that the deceptive poster campaign currently on display in airports around the world is focused on a campaign to enforce UK regulations on imports of wildlife products. The problems we outlined in our letter were not addressed. However, informants close to WWF UK suggested that our letter had caused the WWF board to raise question to their staff about the publicity program and there had been some internal recognition that the substance of the campaign had been oversimplified and distorted in the promotional material. After discussion, we agreed to maintain the dialog that has been initiated by proposing to assist WWF re-focus its campaign toward how the public

can differentiate legal permitted products from illegal unpermitted ones. It was also recommended that the correspondence be copied to the UK CITES management authority. The Executive Officer drafted the following reply:

29 October, 1996

Mr. Robin Pellew, Director WWF-UK
Panda House, Weyside Park, Catteshall Lane
Godalming Surrey GU7 1XR, UK

Dear Mr. Pellew:

Thank you for your response to our letter of May 29. I have delayed answering until after our Steering Committee Meeting held 15 October 1996 in Montreal when I had an opportunity to discuss your letter with the CSG Chairman and Steering Committee. I can now reply with their reaction. The Steering Committee was very pleased that you have opened a dialogue with us and we feel that the matter is of sufficient importance that we should continue to discuss it.

We were not entirely satisfied with the reply you gave as it appeared to miss our main point that the effect of the poster (independent of your intention) is to discourage sustainable use which is good for crocodilian conservation. However, your reply, with the attached brochure (which unfortunately was not in evidence near your poster at the time our members saw it in Heathrow) certainly clarifies the intent of your campaign. It does still appear to us that the promotional poster (no doubt designed by some PR whiz) has distorted the campaign that WWF, TRAFFIC International and HM Customs and Excise intended, and that the subtleties of CITES controls and permits have become distorted to a simple and deceptive anti-use message.

We certainly agree that crocodilian imports must be accompanied by the necessary permits (which are not in fact required by CITES for personal possessions, but are required, quite legally, by the stricter measures enacted in the UK and several other countries). Educating the buying public that there are such things as legal crocodilian products (in fact the great bulk of products available in most places) and that the programs that produce them are a very positive benefit to the conservation of crocodilians, their habitats and the many other creatures that share them, is a most worthwhile goal. How about replacing your poster with another showing four identical crocodilian handbags, three displayed with their required documentation (for example an Australian personal exemptions CITES tag, a US alligator export permit and a German Reptilartenschutz product label) and prominently labelled 'LEGAL', and one lacking documentation labelled 'BANNED'. Instead of 'By Bye' with its obvious 'Don't buy' message, the poster could be headed 'Buy legal'. Not so snappy as 'By bye' perhaps, but with the undeniable advantage of being both truthful and a positive contribution to crocodile conservation. I think it is very important that we (or I should really say you) do not allow the public relations appeal of simplicity to override the really important, and complex, conservation tasks we are all engaged in.

We look on the WWF family, and on WWF-UK, as natural allies in the conservation struggle. That is why we continue to think it important that we share our thoughts on this issue, gently chide you when we feel you are in error, and continue to offer our assistance so that you can get it right. Let's keep the communications open on this. Best wishes.

Yours sincerely,

James Perran Ross, Executive Officer CSG

Review of Zimbabwe crocodile program. CSG members G. Webb, A. Velasco and D. David evaluated the review of the Zimbabwe program drafted by Professor J. Loveridge and their comments have been submitted back to the Zimbabwe Department of Parks and Wildlife. The commentators agreed on the great depth and value of Prof. Loveridge's review which draws attention to several aspects of the program that require attention and improved operations. The evaluations endorsed the recommendations of the review and CSG has recommended that Parks and Wildlife, in conjunction with the Crocodile Farmers Association, move to address these recommendations and implement some renewed management actions to re-establish the credibility of the program. Jon Hutton reported that action on this matter is made complex by recent changes in the Zimbabwe government and some institutional dislocations that have resulted. The IUCN Regional Office for Southern Africa has undertaken a key role in facilitating progress on a number of wildlife management issues and the CSG recommendations have been passed to them as well. A workshop has been scheduled for 28 -29 November for IUCN-ROSA, CFAZ, the government and other interested groups to address wildlife management issues. It is hoped to insert discussion of the crocodile management program in this discussion and CSG has offered to send a technical expert to assist this discussion. Following the Steering Committee meeting these recommendations were presented directly to representatives from IUCN-ROSA and Dept. of Parks and Wildlife. Continued communication to the players will be needed to implement action on this problem.

Captive breeding statement. The draft policy on captive breeding developed in Argentina was reviewed and approved.

Aware that CITES Conference Resolution 8.3 establishes that trade in some species of wildlife can generate conservation benefits;

Recalling that many species of crocodylians were placed on Appendix I of CITES, which limited any commercial activity to closed-cycle captive breeding;

Recognizing that commercial captive breeding can and has generated conservation benefits for some species of crocodylians in some countries;

Acknowledging that the Crocodile Specialist Group has encouraged captive breeding for conservation programs;

Accepting that wild harvest programs carried out on a sustainable basis link the benefits derived from commercial use directly with the wild populations and their habitats, which is not the case with commercial captive breeding;

Recalling IUCN Resolution 18.24 which acknowledges the conservation benefits from sustainable wild harvest programs;

Concerned that the conservation benefits derived from sustainable wild harvest programs can be undermined by excessive production from closed cycle captive breeding programs, with little and sometimes non conservation benefits, as described in CITES Conf. Res. 8.22;

The Crocodile Specialist Group:

Will continue to encourage conservation programs based on sustainable use of wild crocodile programs,

Will not encourage the pursuit of commercially oriented closed-cycle captive breeding programs where they are likely to undermine conservation efforts relying on the sustainable use of wild populations,

Where conservation benefits may result, will assist countries with programs based on closed-cycle captive breeding to extend their management activities to include sustained use of wild populations.

Ranching proposals for COP 10. Proposals for ranching crocodiles were submitted to CITES by Argentina (*Caiman latirostris*), Uganda and Madagascar (*C. niloticus*). Following a request from the SSC Trade Program for rapid technical review of these proposals, they were circulated by SSC Trade program to a selection of CSG members (6 each proposal) suggested by the Executive Officer. Concerns were expressed by the Steering Committee that the independent comments of members might not reflect the consensus view of the Steering Committee or CSG and might be misrepresented to be official CSG opinion. Several Steering Committee members expressed annoyance that they had not been directly consulted on proposals from their area. The Executive Officer explained his intention to first solicit technical comments from members, and then to request coordinated comment from the Steering Committee from which a coherent and non-contradictory recommendation could be developed. Unexpected difficulties arose from the timing of the proposal review process that requires official comments to be returned to proponents so that they can submit revised proposals by January 1997. To resolve this difficulty the Steering Committee delegated a small subcommittee of G. Webb, J. Hutton, O. Behra and R. Jenkins to quickly review the proposals and submit comments and make general recommendations for the Chairman to transmit to IUCN and CITES Secretariat, with the further understanding that there would be additional consultation directly to the proponents in the course of final proposal negotiations. The Executive Officer was asked to advise all Steering Committee members that they could request copies of the proposals for review.

Argentina proposal. Alejandro Larriera requested the support of the Steering Committee for a process to bring the various States of Argentina together to coordinate crocodilian management policy. A letter was drafted following the meeting.

Universal tagging. Questions raised by the United States concerning what kind of tags should be applied to clear containers of crocodilian skin parts and scraps were presented to the CITES Animals Committee at their meeting in Prague in September and clarifying notification to the parties was drafted. The clarification confirms that tags on skins must meet all the requirements of Res. Conf 9.22 but that the tag placed on a bag of parts may be either a tag similar to a skin tag or some other tag (e.g. adhesive paper) as long as it is non-reusable and the specified information for exports or re-exports is present.

Export Quotas Res. Conf. 6.17. Dietrich Jelden called the attention of the group to Resolution 6.17 which has been effectively replaced by Res. 9.22 (Universal Tagging) but which remains in effect and is technically in contradiction to 9.22. It was apparently an oversight in the development of 9.22 that 6.17 was not repealed. After brief discussion it was agreed that this matter could be easily solved by the CITES Secretariat as part of its process of consolidation of resolutions currently underway and that a letter advising they consider this in their process

be sent.

Captive Breeding Resolution. A process to reform the CITES regulations for Captive Breeding has been underway since September 1995, coordinated by Charles Dauphine of Canada and has generated wide discussion of the issues. Hank Jenkins reported that matter received discussion at the Prague Animals Committee meeting and that a draft resolution is in preparation for discussion at COP 10.

Transfer of commercial samples. A very sensible proposal has been made to allow the movement of trade samples from one country to another and back again without invoking all the lengthy complexities of import and export permits at both ends. A proposal has now been drafted by the Animals Committee to allow CITES parties to issue a single 'export-re-import permit' that will allow samples to leave and return easily. The proposal will be considered at the 10th COP.

New CSG Brochure. The new brochure was presented. Assistance with graphic design and production was gratefully received from Environmental Science and Engineering Inc., Smittle & Associates and Lyn Lawhead and the Alligator Cycle of Protection, Inc. We are also grateful to Harry and Peter Freeman, Carlos Yamashita, Andres Vallejo, Rom Whitaker, Jack Cox and Harry Andrews who allowed us to use their photos. Cost of production was \$460 or \$0.09 per copy. Samples were distributed with Newsletter Vol. 15 (3) and a supply provided to Vice chairmen. Additional copies can be obtained by request to the Executive officer.

Indonesia. After reviewing the long history of CSG efforts and investment in improving crocodile management in Indonesia (see minutes Steering Committee 1990 - 1996) the chairman asked what the current situation was. Hank Jenkins reported that he visited Indonesia last May and was reassured that there was no intention of unilaterally opening the current trade embargo. He explained that some hardship was experienced in Irian Jaya where the crocodile trade was one of the few cash sources for many people, and that political pressure from Irian Jaya to re-open trade had prompted earlier discussions of lifting the embargo, which had now been withdrawn. PHPA was trying to develop a management plan that would be acceptable to CSG and the international community and also be realistic and practical in Indonesia. Current activities are focused upon management of wild populations in Irian Jaya and the regulation of farms. Some positive advances have been made. LIPI, the scientific agency in Indonesia, has conducted crocodile surveys in Irian Jaya in 1995 and 1996. Dissemination of the results of these surveys is strongly recommended. The CSG project on *Tomistoma* in Sumatra has received great practical assistance from PHPA and good preliminary results on distribution and biology of this very rare species is now being obtained. A draft management plan has been prepared and sent to CSG members G Webb and H. Jenkins to informally review.

Mr. Dwiatmo Siswomartono of PHPA confirmed that Indonesia would not re-open trade without CSG review of its management plan and that this plan was being developed. He stated that Indonesia was ready to send the plan to the Secretariat and to invite CSG to a review of the plan and its implementation. He also reported that PHPA is developing a system to monitor movement of crocodile skins within Indonesia and that there have been several successful interdictions of illegal trade from Irian Jaya to Thailand and Papua New Guinea.

Steve Broad noted that staff changes had slowed development of crocodile management, but that he thought we could now move forward to assist the management plan implementation. He noted that there continued to be a substantial flow of manufactured crocodilian products

leaving Indonesia as personal possessions and that the current situation was not satisfactory from a conservation perspective.

It was noted that although there may have been expectations of a prompt movement toward developing a management plan and reopening trade after a CSG review, that in fact no schedule was established, and experience with the very slow progress of regulatory changes in other countries (the 12 years for US to change its *C. porosus* regulations as an example) suggested speed of progress in Indonesia might also be slow and our expectations need to be realistic.

Dwiatmo closed the discussion by proposing to informally circulate the draft management plan to CSG and requesting continued communication on the issue. He requested a preliminary target date for a CSG review and proposed that review in Indonesia might be possible as soon as late February. Professor Messel agreed that CSG would be very pleased to receive an invitation from the Indonesian government to conduct a review in that time frame.

Tanzania. Dietrich Jelden had proposed to meet with Tanzanian representative Emmanuel Severre in Europe in September, but it was thought that the meeting had not occurred. No additional information on the level of harvesting of wild crocodiles or the status of Tanzania's request for a 1997 harvest were available. Noting that the agreement negotiated in Fort Lauderdale in 1994 left the responsibility clearly with Tanzania to report to the CITES Secretariat on the quota harvest as a condition of obtaining quotas beyond 1996, it was agreed to await further information.

Honduras. Eric Fernandez presented a detailed list of actions taken in Honduras to implement the recommendations derived from discussions in September 1995 with the CITES Secretariat, Animals Committee and CSG. A new law (Presidential decree # 2578-95) was passed incorporating most of the recommendations applying generally to captive breeding operations. A second set of detailed recommendations on procedures to regulate crocodile farms and issue export tags and permits had been referred to CODEFOR, the CITES regulatory agency, for incorporation into their procedures and regulations. The finalization and implementation of these regulations appears to be the only remaining impediment to approval of the registration of the San Pedro Sula farm for *C. acutus* and is entirely in the hands of the Honduras authorities (as it has been for the past year). Eric reported that the farm currently holds about 10,400 animals and is producing 2,000 - 3,000 hatchlings/year. One of the other farms in Honduras (GGI) has closed and the stock are said to be in poor condition pending their dispersal to alternate facilities which is delayed by legal procedures. The other Honduras farm (Midence) is restricted to tourist viewing. CODEFOR has been inspecting the farms regularly and has temporarily stopped issuing import permits for caiman skins of Nicaraguan origin until the current flow of skins between Nicaragua, Europe, USA and Honduras can be understood.

Noting that development of adequate regulations for crocodile farms has been integrated into comprehensive wildlife management and conservation regulation, the meeting expressed its admiration of these advances and hope that they would soon be complete. Ecuador. Following discussions between Dr. A. Paucar of INEFAN, Ecuador, and alligator experts Tommy Hines and Phil Wilkinson, plans are underway to conduct a technical training workshop for crocodilian management in Ecuador. This will be part of the slowly developing management and regulatory structure in Ecuador to support ranching of *Melanosuchus niger*, which is underway on an experimental basis.

Philippine crocodile. Perran Ross summarized a sequence of recent contacts between CSG, the Melbourne Zoo (Australia), Fort Worth Zoo and Gladys Porter Zoo (USA) and the Department of Environmental Resources, Silliman University and Crocodile Farming Institute (Philippines) concerning an integrated approach to management, captive breeding and in-situ conservation of the Philippine crocodile. All the participants appeared to be coming together and the time is considered to be very appropriate to convene a meeting of all interested players to develop a coherent strategy for the conservation of the species. Discussions have been opened with representatives from the Philippines government on their needs and desires for technical and practical assistance. It was noted that the recent suspension of hostilities between the central government and Muslim separatists in Mindanao opened the opportunity for the first time in many years for surveys and practical conservation action in the Ligusan Marsh, thought to be a remaining stronghold of the Philippine crocodile. The area may be suitable for community based ranching to encourage crocodile and crocodile habitat conservation rather than development as rice fields. The Executive Officer was encouraged to continue facilitating dialog between interested parties with the aim of developing a forum where a conservation and management plan integrating all these ideas and interests can be constructed.

Crocodile data bank. A proposal prepared by WCMC and Lorrie Collins, to collect a wide variety of crocodile data (e.g. trade information, distributions, specimens, habitat) was presented for information. It was not clear whether this proposal is part of ongoing efforts to form an SSC wide data base for Specialist Group Information, and to amalgamate SSC/IUCN databases in Biological Conservation Information System (BCIS) with information from other conservation partners. No current action by CSG is required and Steve Broad undertook to keep the Steering Committee advised on how this issue develops.

Points to evaluate management programs. Following discussion at Santa Fe in May on the draft 'criteria' for evaluating crocodile management programs, John Thorbjarnarson undertook to revise the draft. An amended version was submitted for consideration. The Committee emphasized again that the word 'Criteria' implied too restrictive a conception of what were conceived to be very broad and flexible guidelines that might be considered or adapted. On this point the document was referred to additional consideration and testing in field situations.

European crocodile conservation center. Olivier Behra outlined his current activities organizing a crocodile display near Paris that was conceived to be the nucleus of an international center for education and conservation research on crocodilians. With support from a philanthropist, it was hoped to make the planned facility a vehicle for conservation in francophone Europe and Africa. The chairman asked Olivier to keep the CSG advised on his progress.

SE Asian concerns, Vietnam farm registrations. Information was presented that Vietnam has currently 2 or 3 proposals under consideration for the registration of crocodile captive breeding facilities by CITES for international trade. The very rapid expansion of crocodile farming in Vietnam has been well documented in the Newsletter. Concerns were expressed that Vietnam was proceeding rapidly on the path that Thailand had taken, with total commitment to captive breeding and little or no consideration of conservation of wild populations. A result similar to that in Thailand, with virtual extirpation of wild crocodiles, is considered unacceptable but no concrete proposal for action to prevent this was made. CSG contacts and influence in Vietnam remain limited.

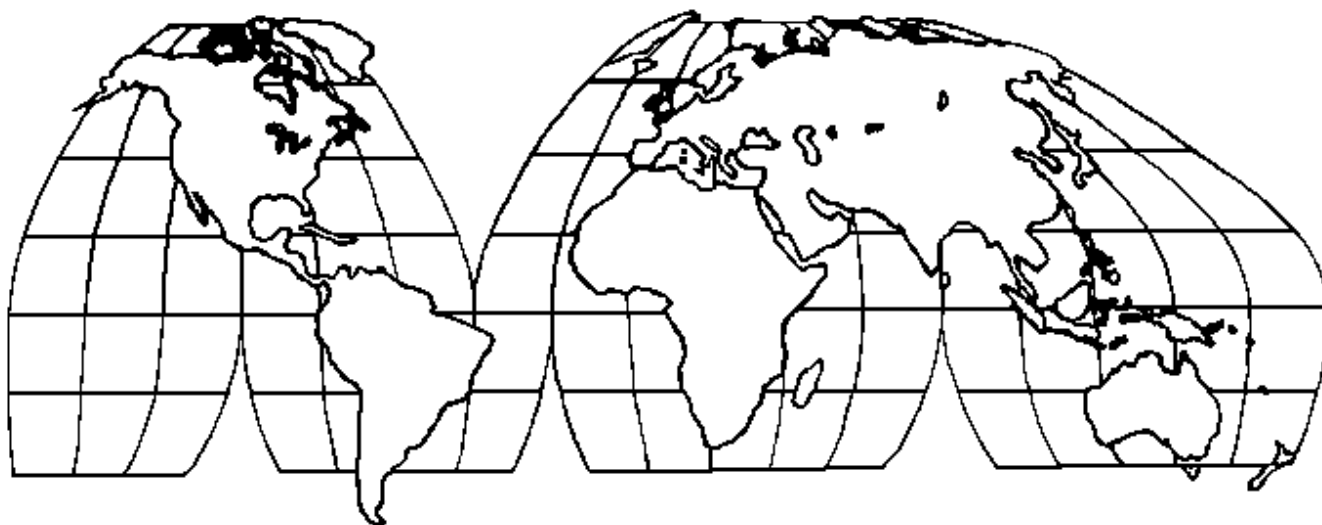
Concern about *Alligator sinensis*. Grahame Webb expressed concern that the Chinese alligator

remained the most critically endangered crocodylian species in the wild, and that little was known about recent events regarding conservation or captive breeding efforts. Some updated information on captive breeding efforts was available as correspondence to the Newsletter 15 (3). Noting the activities of the Wildlife Conservation Society in Chinese conservation, the Committee agreed to ask John Thorbjarnarson to track this matter. Steve Broad noted that there was funding currently available for field conservation in China and a broadly recognized need to re-focus Chinese conservation toward wild habitats. The Executive Officer was asked to correspond with Dr. Wang Sung of the Academia Sinica to make this point.

Next meeting. The Steering Committee recommended scheduling a meeting in Harare, Zimbabwe, shortly before and during the 10th Conference of the Parties to CITES, but noted that review and continued input to CITES proposals would have to be conducted by the committee prior to that meeting by fax. Hank Jenkins advised the meeting that negotiations were underway between the Zimbabwe government and CITES regarding hotel costs, which had been artificially elevated for the duration of the CITES meeting, but that a reasonable outcome was expected. There being no further business the meeting closed at 5.45 p.m. P. Ross, *rappporteur*.

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AREA REPORTS



AFRICA

Kenya

KENYA AND TANZANIA: NATIONAL CROCODILE MANAGEMENT PLANS. In Kenya, the Kenya Wild Service (KWS) has prepared a management plan that encourages the management of Nile crocodiles through ranching and conservation by promoting sustainable utilization. In protected areas only non-consumptive utilization such as tourist viewing is allowed. Outside protected areas, where human-crocodile conflicts are on the increase, utilization through tourist facilities and ranching is encouraged. Sport hunting has been banned in Kenya since the late 1970's so this is presently not an option for utilization.

In Tanzania, crocodiles are managed by the Department of Wildlife. They have also prepared a management plan for the Nile crocodile (*Crocodylus niloticus*) and long-snouted crocodile (*Crocodylus cataphractus*) which provides information on legislation, conservation, ranching, monitoring and sport hunting.

In both management plans there is a section under ranching which states "that 2 years from the date of issue of permit ranches may be required to release a number of female crocodiles 1.2 m in length equivalent to 5% of the specimens collected from the wild". This section needs to be reviewed as there are many issues that have not been addressed. The release of crocodiles, and most other animals, requires a strategic approach. There have been many documented cases involving the uncoordinated release of crocodiles worldwide. Crocodiles released in swamps and lakes have disappeared from the release site. In rivers, crocodiles have been swept many kilometers downstream, from the release site. Crocodiles destined for release need to be maintained in pre-release pens for several weeks to gain familiarity with their surroundings. They also have to be gradually weaned off their captive diet and be encouraged to hunt prey for themselves.



Nile Crocodiles at Arba Minch Crocodile Farm, Ethiopia, L. Berhanu photo.

Crocodiles that are destined for release need a thorough veterinary examination to determine their pathogen loads so that diseases are not

transferred from captive facilities to wild populations. There have been recent outbreaks of a mycoplasma disease in captive facilities in several countries (pers. comm., Dr. Perran Ross, Crocodile Specialist Group). The introduction of crocodiles both wild to captive and captive to wild can prove disastrous if veterinary screening and re-introduction protocols are not followed and strictly controlled. There are IUCN/SSC Re-introduction Guidelines which provide details on re-introduction requirements. The IUCN/SSC Re-introduction Guidelines are available from the author.—Pritpal Soorae, *IUCN/SSC Re-introduction Specialist Group, African Wildlife Foundation, P.O. Box 48177, Nairobi, Kenya.*

Zimbabwe

UPDATE; NATIONAL MEETING FOR CROCODILE MANAGEMENT. A workshop was convened by IUCN Southern Africa, 28-30 November, attended by representatives of the Department of National Parks and Wildlife, the Crocodile farmers Association of Zimbabwe and the CSG (Grahame Webb and Jon Hutton). Following general discussion of the review report drafted by Dr. John Loveridge, and of the various comments to that report, the workshop broke into two facilitated groups to address administrative and conservation aspects of a new management program. A most constructive discussion was held and very valuable elements of a crocodile management program were identified and discussed.

A great many specific points raised by the Loveridge report are currently being addressed, including a review and analysis of nest data. It is clear from available data that crocodile populations in Zimbabwe have recovered significantly under the sustainable use program, remain healthy and are probably increasing.

The workshop provided a forum for interaction and discussion between the producer sector and the government agency and sets the stage for development of revised management policy responding to the current situation and Zimbabwe domestic needs. CFAZ and DNPWL have clarified their respective responsibilities and the CSG remains available to respond to their requests for technical assistance. Overall, the process has significantly strengthened confidence in the continuing soundness and sustainability of Zimbabwe's crocodile management program.—Grahame Webb, *CSG Vice Chairman for Eastern Asia Oceania and the Pacific, P.O. Box 530 Sanderson NT 0812 Australia.*

ASIA

Cambodia

CROCODILE TRADE FROM CAMBODIA. Siamese crocodile skin products on sale in Siam Reap come from crocodiles farms in the town, but also from crocodiles in the Tonle Sap lake. Traders at Poipet market reported that live young Siamese crocodiles were being smuggled to Thailand to supply crocodile farms (Nash 1992), but according to one trader this was no longer such a profitable activity as it had been prior to 1993. Before 1993, when the price of crocodiles was US \$200-300 per animal, one trader claimed to have imported crocodiles from Vietnam and sent them to Thailand via Phnom Penh. Nonetheless, Siamese crocodile products were observed for sale on the outskirts of Poipet in 1994, and a trader in Ban Long claimed to ship crocodiles to Vietnam regularly.

A crocodile farm has existed in Phnom Penh since 1979, when the price of a three-meter adult was said to be the same as in 1994, namely \$5,000. The farm reports selling about 300 live crocodiles a year, mainly to Thai and Malaysian customers, for whom it claims export permits can be arranged. Although Cambodia is not a Party to CITES, importation of this Appendix I listed species to Thailand or Malaysia would likely be illegal. At the time the farm was visited (in 1994 Eds.) it held about 40 adult animals, believed to be *C. siamensis*, all taken from the wild around Battambang and Siem Reap.

Investigators were repeatedly informed of the export trade in wildlife from Cambodia. Vietnam and Thailand were most frequently cited as export destinations. A Cambodian Customs official interviewed asserted that the ultimate destination of wildlife exported to Vietnam was China. Passage between Cambodia and Vietnam was said to be very easy prior to the election of the current Royal Government of Cambodia in 1993, since when Vietnam has tightened regulations for Cambodians crossing its border. The border between Cambodia and Thailand is said, by one former trader, to be crossed freely, although Nash noted that in 1992 the Thai Government had moved to reduce wildlife trade at the Poipet-Aranyaprathet border point at least. —extracted from A REVIEW OF THE WILD ANIMAL TRADE IN CAMBODIA, (*results of a survey in 1994*) E. Bradley Martin and M. Phipps, 1996. *TRAFFIC Bulletin Vol 16 (2):45-60.*

India

POLLUTION STUDIES OF THE GANGA RIVER. Biomonitoring of 645 km of the Ganga River was conducted between Rishikesh and Kanpur in Uttar Pradesh State from 1993 -1995. Studies were conducted on water quality, physico-chemical, bacteriological and biological parameters and animal species diversity. The water in the Ganga is regulated through 4 barrages and diverted into three major agricultural canals. Water is also diverted for power projects at Chilla, Rishikesh and the National atomic power station at Narora. River flow decreases from 40.2 m³/min at Rishikesh to 23.0 m³/min at Kanpur. The river is subject to large seasonal changes varying from 200 m width in the summer dry season up to 1.5-2 km during the monsoon.

The physico-chemical and bacteriological studies revealed increasing amounts of pollution from domestic sewage, sugar factories and chemical industries and tanneries. Pollution is more severe in the downstream sections. Biodiversity remains high with 15 molluscs, 51 insects, 4 freshwater prawns, 83 fish, 12 species of freshwater turtle and river dolphins. Mahseer, a valuable game fish, and river otters appear to be negatively impacted.

Two species of crocodile were identified, *Gavialis gangeticus* and *Crocodylus palustris*. Muggers are captured in fishing nets and natural breeding was recorded, with hatchlings discovered at Narora in October 1993. Large muggers were seen at five localities and a large number of mugger were present in the Ganga agricultural canal. Gharial were also found at four locations in smaller numbers. A total of 225 captive reared

Gharial have been released by the Uttar Pradesh Forest Department into the Ganga. The section of the river between Bijnor and Narora appeared to be a center of distribution for crocodiles and dolphins.

Recommendations for the protection of crocodiles were to undertake detailed studies to identify more habitats and populations and efforts to give legal protection to suitable habitats to accommodate surplus stock that is held in captivity. Additional recommendations were made for improving management programs for conservation and ecological restoration and protection of key areas of the river.—*Summarized from STUDIES ON BIOLOGICAL RESTORATION OF GANGA RIVER IN UTTAR PRADESH: AN INDICATOR SPECIES APPROACH. Final technical report 1995.* R. J. Rao, with B. K. Sahu, S. K. Behera & R. K. Pandit, *School of Studies in Zoology, Jiwaji University, Gwalior 474 011, India.*

CROCODILE POPULATION EXPLOSION. Population explosion is not a problem confronting human beings alone. The problem faces crocodiles also. The day is not far off when the 185 inmates of the Crocodile Rehabilitation Center at Hogenekal will be transported to their natural habitat as the present stone walls cannot accommodate them any longer.

The Center, started in 1975 to preserve the highly endangered animals, is probably facing closure with the Government of India asking the State Government to find a suitable natural habitat for them which would not affect the human population. District Forest Officer Dr. S. Paulraj pointed out that there were hardly any wild populations of crocodiles at present due to human greed. "The crocodiles were capable of laying even 50 to 100 eggs at a time and it is virtually impossible for us to rear everything in captivity," he said.

Hogenekkal Center had as many as 345 crocodiles in 1983. Later 80 were let into the Sathanur Dam area, a few sent to Madras Zoo, some let into the Mettur dam and about half a dozen sent to Kolar. Dr. Paulraj said the huge increase in crocodiles bred in captivity had become a problem all over the country but as a schedule 1 protected species its trade was banned. The Inspector General of Forests, Government of India, had responded that he was prepared to permit trade in crocodiles if the State Governments were able to identify suitable natural habitat for them. He had stipulated that such habitats, which would not be in any way dangerous to the human population, should be saturated, then the Center is prepared to allow crocodile trade. On that basis the Conservator of Forests has instructed the district officers to locate such habitats. In Dharmapuri, we have located the Denkanikota range, a river course of about 20 km in dense forests. This will become a prohibited area for people under the control of the Forest Department and there is no chance of the crocodiles escaping from there. A mini crocodile center as a tourist attraction is also being planned at Hogenekkal. -- *extracted from THE HINDU (Madras) 30 September 1996, submitted by Harry Andrews, Madras Crocodile Bank, Post Bag No. 4. Mamallapuram, TN 603104, India.*

Vietnam

HATCHING SUCCESS AT BAO NGU. After visiting alligator farms and facilities in USA in 1995, Mr. Pham Van Muoi, owner of the Bao Ngu crocodile farm, instituted greatly improved incubation techniques similar to those used in the USA. By carefully controlling temperature and humidity in artificial incubators he has achieved hatch success averaging 38% for two seven year old crocodiles and 90% for the nests of two 10 year old crocodiles (all *C. siamensis* of Vietnamese origin). Temperature of incubation was 30° C and humidity from 90%-100% , hatch time was 72 -75 days. These hatch rates (overall average 64%) are very much improved from prior performance at the farm and he will be using these techniques for future incubation.

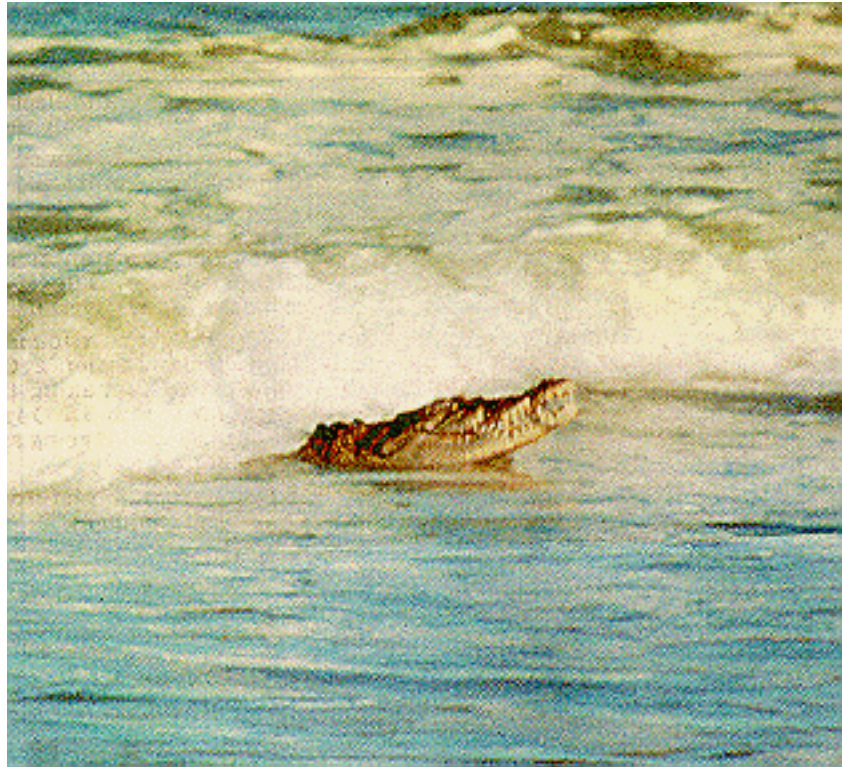
The farm currently holds over 200 crocodiles including *C. siamensis*, *C. rhombifer*, *C. porosus* and hybrids between these. Boa Ngu is just one of several dozen crocodile farms in Vietnam which are developing rapidly on the Thai model of closed captive breeding and looking to Europe and Asia, particularly China, as the likely market for commercial products in the future. The status of crocodiles in the wild in Vietnam is poorly known and little conservation action is underway.—*from litt. Pham Van Muoi, Bao Ngu Crocodile Breeding Farm, 94b/1055 Nguyen Oanh Street, Go Vap, HCM City, Vietnam & VIETNAM NEWS August 1995.*

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AUSTRALIA / OCEANIA

Australia

SURFS UP FOR COOL CROC. Phil Cook thought someone had put hallucinogens in his beer when he spotted a 2.5 m crocodile literally surfing at popular Four Mile Beach, Port Douglas (Queensland). Mr. Cook said he couldn't believe his eyes, and was too excited to be afraid, when the crocodile appeared in shallow water several meters in front of him, looked directly at him, then opened its mouth and swam back into the surf before riding waves back to shore. Cook had his camera with him and took some shots.



"It looked like it wasn't bothered by the crowd and just wanted to get on with enjoying itself, but obviously you can't take chances with crocodiles so I kept everybody back as a precaution," he said. Police and Department of Environment rangers continued to watch the crocodile as it continued to move south and disappeared in the Mowbray river estuary. Traps have been set and if the croc is caught it will be moved to a National Park. The sighting was the latest in a spate of crocodile appearances in populated areas around Cairns and calls have been made to have them removed before a fatal attack on humans occurs. But Mr. Cook said his experience convinced him he should move permanently to Port Douglas.— *From THE SUNDAY MAIL (Brisbane) 3 November 1996, submitted by H. Messel, Bond University, Gold Coast, 4229 Qld. Australia.*

Indonesia

REPORTED SIGHTINGS OF CROCODILES IN KALIMANTAN. From 1992 to 1996, both authors have extensively surveyed on and around the river systems of Kalimantan, the Indonesian part of the tropical island of Borneo. Resit S szer predominantly worked around the middle and upper reaches of the Mahakam River in East-Kalimantan, on a project to identify the remaining populations of the Bornean Peacock Pheasant (*Polyplectron schleiermacheri*). Erik Meijaard travelled on most of the larger rivers of West, Central and East Kalimantan in an attempt to clarify the conservation status of the orang utan (*Pongo pygmaeus*) and the Sumatran rhinoceros (*Dicerorhinus sumatrensis*). We started our surveys in an area by interviewing local people, and asking them about their knowledge of the local fauna. Thus we obtained a considerable amount of

information on the possible whereabouts of many animal species, including crocodiles. This short report lists our indirect information and sightings of crocodiles. In spite of the limited insight into the distribution of the actual species that we can provide here, this information can be used to specify areas of interest for further, more detailed surveys. Reported crocodile locations with approximate longitude/latitude are available from the authors or CSG.

Mahakam River, East-Kalimantan. On the Mahakam River in East Kalimantan local people report the presence of three different species of crocodile: one with a long and narrow snout (probably *Tomistoma schlegelii*, further referred to as 'TS'), one yellowish colored with a short snout and a third species, similar to the previous one, but colored dark green to black and more aggressive. The two latter species will be referred to as 'C1' and 'C2', because of both the relative unreliability of our indirect sources of information and the difficult specific identification of the members of the *Crocodylus* family. No crocodiles were reported on the Mahakam, upstream of the Long Bagun rapids.

On the Ratah River (western tributary of the Mahakam River, between Long Iram and Long Bagun) all three species (TS, C1 and C2) were reported to occur. Furthermore, a TS nest site is located in a small lake of the Pari River, one of the upstream tributaries of the Ratah River. This (oxbow) lake still contains water in the dry season, which is approximately between July and September. During these months many gharials lay their eggs in mounds of leaves around the lake. Another lake can be found in the Pari River area which contains many small crocodiles (breeding site?).

On the night of 16/17 March 1996, we heard a sound, similar to the sound of canoes falling in water, which was explained by local people to be emitted by mating crocodiles. This loud and very regular sound was heard on the Dason River, a small tributary of the upper Ratah River, after a period of relatively prolonged drought.

On 21 March 1996, a boat driver reported the sighting of TS on the Mahakam River about two hours from the mouth of the Ratah River. Apparently, the animal was about as long as the man's boat (\pm 8 meters). On 17 April 1996, in the area of Long Iram, a captive TS was seen by RS. This specimen had been caught in a fishing net further upstream on the Mahakam River. Another crocodile is apparently kept in Tanjung Isui, on one of the Mahakam Lakes, as a tourist object to be photographed for a small remuneration (EM).

Finally, at the end of September 1992, RS saw two 'short snouted' crocodiles (C1 or C2) on the Semayang Lake north of Kota Bangun. This lake is one of a group of lakes in the middle reaches of the Mahakam River; however, only the Semayang Lake was said to still contain crocodiles.

Trade and captive breeding of crocodiles was reported from several locations around the Mahakam River. RS saw a man selling 'traditional' medicines in Samarinda in May 1996. Among others he had the skulls of TS and a 'short-snouted' species, which originated from the Muara Kaman area, a nature reserve (in poor condition), north of the Mahakam River. Captive breeding was reported from Matalibag, a village on the Pari River, where someone keeps several captive TS. In August 1995, the owner collected 41 eggs in the wild, which he subsequently incubated at home. A final report concerning captive breeding in the Mahakam area comes from Samarinda where approximately 5 years ago more than 200 crocodiles escaped from a crocodile farm; it is unknown which species were thereby released into the wild.

Along the Ratah River a few people still search for crocodile eggs between July and September. These eggs are said to have medicinal powers to cure skin diseases. The Punan and Bakumpai Dayaks in that region do not hunt crocodiles as these are considered sacred. Killing a crocodile will cause the death of one of their children. These people do not fear crocodiles because they believe that only people with an (invisible) mark will be attacked. The tribes' medicine man is able to see this mark. When a local accidentally catches a crocodile in his fishing nets, he will immediately release it. Everyone in this area knows that crocodiles are protected by law. Punans and Bakumpai originate from the north-eastern part of Central Kalimantan, which may partly explain why crocodiles can also still be found in that area (see section on Central Kalimantan).

A very skillful hunter from Datah Bilang retired a few years ago. He used to catch crocodiles by means of an 'alir' [also described in Eric Hansen & W.O. Crohn, *In Borneo Jungles*, page 133], and also by spearing them at night from a canoe.

Other areas in East Kalimantan. In the swamp area, both east and west of the Muara Kaman Nature Reserve, crocodiles were reported to be still abundant. Similar reports came from the Karangan River, just south of the Sangkulirang peninsula, where crocodiles were reported to occur, although they were getting rarer and were mostly seen in the small tributaries of this river. In the village of Manubar on the Karangan River, and in the village of Sangkulirang itself, several people were reported to breed crocodiles for the skin trade; a black and a yellow species apparently occurred on this river system.

Central Kalimantan. In this province crocodiles were reported to occur in the following areas:

- Pinang River (tributary of Kapuas River); one 3 meter crocodile sighted.
- Sirat River (tributary of Kapuas River); approximately 15 crocodiles were seen.
- Tanjung Puting National Park; crocodiles were reported to be common in the area close to Camp Leakey, on several smaller rivers and around the isolated 'Danau Burung'.
- In the upper reaches of the Jemaras River, a small tributary of the Sampit River, crocodiles were reported to occur. This area of fresh water and peat swamp forest has been logged, but most timber concessions there had stopped their activities in 1996.
- In the small rivers on the north side of the Sembuluh Lake crocodiles were reported to occur. The soils in this area are very poor in organic material and the main vegetation type is heath forest. Therefore, development of the area has remained limited and human population density is low.

West Kalimantan. Few reports were collected in this area, as relatively little time was spent here. However, this province may harbour important populations in, for instance, the Danau Sentarum Wildlife Reserve and other areas in the upper Kapuas River. Crocodiles were reported from the Gunung Palung National Park and the Kendawangan Nature Reserve. On the latter it was reported by Noor and Hanafia (1995) that mainly *Crocodylus porosus* was found in the area of the Blaban River, and that in 1989 three specimens were caught by local fishermen. In Sintang, a town in the middle reaches of the Kapuas River, EM met a man selling crocodile penises as virility medicine. According to the trader, his goods originated from the Banjarmasin area in South Kalimantan, although it was unclear whether he had obtained them from a crocodile farm or if they had been caught in the wild. In Bogor (West Java), Samarinda (East Kalimantan) and Banjarmasin (South Kalimantan) RS also reported the sale of crocodile penises.—E. Meijaard, *The International MOF-Tropenbos Kalimantan Project Jalan Guntur 13, 16151 Bogor, West-Java, Indonesia and R.*

Sözer, B. v. *Suttnerstraat 49, 2037 LE Haarlem, the Netherlands.*

Papua New Guinea

CROCODILE TRADE ENFORCEMENT. The PNG Department of Environment and Conservation recently apprehended an employee of one of the crocodile skin exporting companies. Although the company, Fisco Investment Pty. Ltd. of Lae, had both a crocodile company buyer's licence and an export license, the buyer's license was issued under a different name from the person using it. This resulted in the Management Authority, the National Crocodile Management Unit of the Department, impounding a shipment and prosecuting the alleged offender for illegally purchasing skins on behalf of a company without a valid crocodile buyer's license. The suspect was summoned and charged and the case brought before the Lae district court on 21 October 1996. The defendant pled guilty and was fined K 250.00 (US \$250 approx). All the skins involved were rechecked and all are within the legal size limit for raw skin commercial exports.

A review is currently underway for all crocodile penalties to be amended and we that that will play a significant role in enforcing the Crocodile Trade (Protection) Act to crack down on violators in the crocodile trade.—Godfrid Solmu, *PNG/DEC, National Crocodile Management unit, P.O. Box 6601 Boroko, Papua New Guinea.*

LATIN AMERICA

Colombia

AVANCE EL LA INVESTIGACIÓN DEL ESTATUS DEL CAIMAN DEL ORINOCO. Con el aval de la Universidad Nacional de Colombia y el soporte financiero de la Wildlife Conservation Society y Colciencias, la Estación de Biología Tropical Roberto Franco adelanto durante enero de 1994 y enero de 1996 el estudio sobre el estado de las poblaciones de *Crocodylus intermedius* en la Orinoquia Colombiana. Esta región con 254,329 km², comprende los departamentos de Arauca, Casanare, Meta Vichada, y las zonas limítrofes entre los departamentos del Guaviare y Guania. El trabajo de campo totalizó 210 días de campo. Los sitios de muestras se seleccionaron previamente en la cartografía disponible en base a la información registrada por Medem en los censos de 1974 y 1975 y a la información reciente de moradores de la región. Para llegar a los lugares de muestro se recorrió 28,000 km por tierra, 5,000 km por aire y 2,476 km por agua, de los cuales 1,085 km fueron censos nocturnos. La información se obtuvo por: 1) Entrevistas no estructuradas a los campesinos y pescadores ribereños familiarizados con la fauna acuática; 2) recorridos diurnos en bote y/o a pie para detectar señales de la presencia del cocodrilo; 3) Censos nocturnos; 4) sobrevuelo por el río Meta.

La región se caracteriza por ser marginal, con muy pocas y malas vías de acceso, pocos asentamientos humanos y con problemas de orden público (presencia de guerrillas) muy marcados. Estas características, dificultaron y en ocasiones entorpecieron el cumplimiento de la programación planeada.

Los resultados de la información colectada (35 adultos observados y 123 calculados) indican la existencia de pocas y muy bajas poblaciones de *C. intermedius* en las zonas visitadas. La mayor parte de los individuos se encuentran dispersos, aislados y solitarios. La población más grande se

encuentro en el departamento de Arauca, entre la red fluvial formada por los ríos Cuiloto, Cravo Norte, Lipa Ele y Casanare, donde se calcula la existencia de una población viable que podría superar los 50 animales adultos con reproducciones exitosas. Poblaciones mucho menores (< 25 individuos) se encuentran, en la zona de la Serranía de la Macarena, depto. del Meta, entre los ríos Guayabero, Duda y los caños Santo Domingo y Lozada; y en el río Vichada, desde su parte alta hasta la desembocadura en el Orinoco.

A pesar de que la ley contempla la protección de esta especie en peligro de extinción y su explotación es prohibida, existe el peligro de que los remanentes de estas poblaciones sigan disminuyendo. Varios factores contribuyen a esto:

- 1) El incremento de las actividades humanas, como la colonización, el transporte fluvial, la pesca con redes (donde accidentalmente quedan atrapados los cocodrilos).
- 2) El saqueo masivo e indiscriminado de nidos por colonos e indígenas, en donde toda clase de huevos (de tortugas, cocodrilos y iguanas) son buscados en las playas durante la época seca y trasladados a sus viviendas para comer.
- 3) La muerte intencional (por temor) de adultos por parte de algunos colonos que justifican su acción, argumentando estar en peligro los niños y los animales domésticos.
- 4) El incremento en los últimos años de la demanda de crías por parte de intermediarios, que pagan a los ribereños cierta cantidad de dinero (según el tamaño) por cada cría. Se desconoce el destino final a donde son trasladadas estas crías.
- 5) La poca presencia efectiva del Estado y de los organismos a quienes corresponde el control y vigilancia, así como la ausencia de programas de conservación, protección y educación ambiental.

Aunque este estudio solo cubrió 70% de los lugares reseñados con alta probabilidad de encuentro *C. intermedius*, se puede concluir de los resultados que la situación de las poblaciones de esta especie es más crítica de la reportada de Medem en 1981. Es importante continuar con los censos poblacionales en toda el área de distribución y diseñar a la luz de la información disponible el pronto establecimiento legal de un sistema que asegure la preservación de las poblaciones viables.—Myrian Lugo Rugeles. *Bióloga Investigadora, programa Conservación del Caimán del Orinoco, Estación de Biología Tropical Roberto Franco, Apartado Aéreo 2261, Villavicencio, Meta, Colombia.*

ADVANCES IN THE STUDIES OF THE STATUS OF THE ORINOCO CROCODILE IN COLOMBIA. Under the auspices of the National University of Colombia and with financial support of Wildlife Conservation Society and Colciencias, the Estación Biología Tropical Roberto Franco has initiated a study of *Crocodylus intermedius* in the Orinoco region of Colombia between January 1994 and January 1995. This region of 254,329 km² comprises the departments of Arauca, Casanare, Meta, Vichada and parts of Guaviare and Guanía. The field study involved 210 days in the field. Sites for sampling were selected in advance using available maps and information recorded by Medem in his surveys in 1974 and 1975, as well as recent information from residents of the region. To reach the sample sites we covered 28,000 km by land, 5,000 km by air and 2,476 km by water, included in which was 1,085 km of nocturnal surveys. Information was gathered from unstructured questionnaires with local rural residents and river fishermen familiar with aquatic fauna, daytime surveys by boat or on foot to detect signs of crocodile presence, nocturnal

surveys and an overflight of the river Meta.

The region is undeveloped with very few and very bad routes of access, little human settlement and problems of public order (the presence of guerrillas). These characteristics made completion of the planned program difficult, and sometimes impossible.

The information collected (35 adults observed and 123 calculated), indicates the existence of just a few small populations of *C. intermedius* in the zones visited. Most of the crocodiles were found dispersed, isolated and solitary. The largest population was found in Arauca department in the river network formed by the Cuilito, Cravo Norte, Lipa, Ele and Casanare Rivers where we estimate there is a viable population of more than 50 adults which are breeding successfully. Much smaller populations (< 25 individuals) were found in the area of the Serrania Macarena in Meta department, between the Guayabero and Duda rivers and Santo Domingo and Lozada creeks; and also in the Vichada river from the upper part to the entry into the Orinoco.

Even though the law provides protection for this endangered species and its exploitation is prohibited, there are some remaining dangers for these diminished remnant populations. Factors which contribute to the problem include:

- 1) The increase in human activities, such as colonization, river transport and fishing with nets (where the crocodiles are accidentally caught).
- 2) The massive and indiscriminate collection of eggs by both indigenes and colonists, in which eggs of turtles, crocodiles and iguanas are found on the beaches during the dry season and taken to people's dwellings for food.
- 3) Intentional killing of adult crocodiles by some colonists (because of fear), who justify their action arguing that there is a danger to children and domestic animals.
- 4) The increase in recent years of the demand for young crocodiles which are purchased by traders, who pay the river folk according to the length of the crocodile. It is not known what the final destination of these hatchlings is.
- 5) The very small effective presence of State authorities responsible for control and vigilance, and similarly the absence of programs of conservation, protection and environmental education.

As this single study covered about 70% of the locations described as having a high probability of finding *C. intermedius*, it can be concluded that the situation of the populations are more critical than described by Medem in 1981. It is important to continue the population surveys over the whole area of distribution and, in the light of the available information, to design and, in the fastest manner possible, to establish a system to assure the preservation of the viable populations.—
Myrian Lugo Rugeles. *Bióloga Investigadora, Programa Conservación del Caiman del Orinoco, Estacion de Biología Tropical Roberto Franco, Apartado Aereo 2261, Villavicencio, Meta, Colombia.*

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Venezuela

MONITOREO DE LAS POBLACIONES DE BABA (*CAIMAN CROCODILUS*) EN LOS LLANOS INUNDABLES DE VENEZUELA. Durante el verano de 1996 se implemento la Pausa Ecológica (Newsletter vol 14(4)) con el fin de realizar un estudio que nos indicara la situacion de las poblaciones de baba sometidas a aprovechamiento y realizar una comparacion de áreas sometidas a cosecha contra otras sin cosecha.

El trabajo fue realizado entre los investigadores del Instituto de Zoología Tropical de la Universidad Central de Venezuela y PROFAUNA, en las seis regiones ecológicas de los llanos inundables, recorriendo una superficie total de 514096 ha, repartidas en 301.646 ha en áreas bajo cosecha y 212.450 ha en áreas sin cosechas.

Este estudio abarco los siguientes puntos; Análisis del promedio de babas por cuerpo de agua en cada región ecológica; Comparación entre tipos de fuentes de luz (faros pilotos versus linterna de frente) en los censos nocturnos; Influencia de la vegetación acuática en el cómputos de babas por cuerpo de agua; Influencia de la vegetación alledaña a los cuerpos de agua versus el numero de babas censadas; Numero de babas observadas por cada tipo de cuerpo de agua; Numero de babas por tamaño de las fincas; Sectores geomorfológicos versus numero de babas observadas; Densidad de la población por región ecológica y su comparación con el estudio de 1992; Estructura de tamaño de la población en cada región ecológica y su comparación con el estudio de 1992; Comparación en densidad y estructura de tamaño en áreas bajo cosecha y sin cosecha.

Entre los resultados mas resaltantes podemos citar los siguientes: Se obtuvieron diferencias significativas en los cuerpos de agua por región ecológica, demostrando la validez de dicha clasificación.

Se obtuvo diferencia entre las fuentes de luz utilizadas, contabilizándose mas animales en aquellos casos que se utilizo la linterna de frente. En aquellos cuerpos de agua sin vegetación acuática se observo mas animales que los provistos de dicha vegetación. No se obtuvo diferencia significativa entre los tipos de vegetación alledaña a los cuerpos de agua.

Los diferentes cuerpos de agua censados mostraron diferencias en el numero de babas presentes. No se encontraron diferencias en el numero de babas por tamaño de las fincas visitadas. No se obtuvieron diferencias significativas entre los sectores geomorfológicos.

En relación a la densidad de babas por región ecológica, solo dos de ellas mostraron disminución en relación al estudio de 1992. Las estructuras de tamaño de cada región mostraron la misma tendencia de 1992, excepto una sola que mejoro apreciablemente el porcentaje de la clase IV (machos de $LT > 1.80$ m). Las áreas bajo cosecha durante los últimos 4 años mostraron una mayor densidad y mejor estructura de tamaños, mayor porcentaje de la clase IV que las áreas sin cosecha.

Todos estos resultados demuestran que el programa venezolano de aprovechamiento de las poblaciones naturales de la especie baba (*Caiman crocodilus*) en los llanos inundables es sustentable, y los resultados serán incorporados para la temporada de cosecha de 1997.

Paralelamente se evaluó la región Guárico, que estuvo vedada por cuatro años producto de una disminución del porcentaje de clase IV. Esta fracción de la población mostró un incremento apreciable,

de 7% a 24% de la población, lo que nos permite incluirla en la temporada de 1997 nuevamente, aplicando los valores de densidad y estructura de tamaño de este estudio.—Alvaro Velasco, *Servicio Autónomo PROFAUNA*. Email: avelasco@marnr.gov.ve

MONITORING POPULATIONS OF *CAIMAN CROCODYLUS* IN THE FLOODED LLANOS OF VENEZUELA. During the summer of 1996 an Ecological Pause (suspension of wild harvest) was implemented with the aim of undertaking a study to indicate the status of the populations subject to exploitation, and to compare areas of harvest with other unharvested areas. This work was undertaken by investigators of the Institute of Tropical Zoology at the Central University of Venezuela and the government agency Profauna, in six ecological regions of the llanos with a total area of 514,096 ha, divided between 301,646 ha of harvested area and 212,450 ha of unharvested. The study embraced the following points: Analysis of the average number of babas by water body in each ecological region; comparison of the results of nocturnal census obtained by different types of lights (spotlights v headlights); influence of aquatic vegetation, vegetation bordering water bodies, ranch size and geomorphological section on caiman counts; numbers of caiman in different types of water body, density and population structure in each ecological region, comparisons with surveys conducted in 1992 and comparison of the density and size structure in harvested and unharvested areas.

Among the more significant results we should cite the following: We found significant differences between ecological regions, demonstrating the validity of these ecological classifications. We found more animals were counted using bright spotlights than head lamps. More animals were observed in water bodies that lacked aquatic vegetation, but the effect of vegetation bordering the water body was not significant. Ranch size and geomorphological section did not have a significant influence on the numbers of caiman present. In the relation of density of caiman to ecological region, only two regions showed a decline since 1992. The size structure in each region showed the same tendency as seen in 1992, except one, which appreciably increased the percentage of Class IV (adult males > 1.8 m). The areas which have been harvested for the last four years showed a better density, size structure and percentage of Class IV animals than areas without harvest.

All of these results demonstrate that the Venezuelan program of exploitation of natural populations of caiman in the flooded llanos is sustainable and these results will be incorporated into the harvest season regulations for 1997.

The Guarico region was evaluated in parallel, where there has been a prohibition on caiman harvest due to the reduction in the percentage of Class IV (seen in the surveys of 1992). This part of the population demonstrated an increase from 7% to 24% which now permits us to include it again in the harvest season for 1997, based on the density values and size structure seen in this study.—Alvaro Velasco, *Servicio Autónomo PROFAUNA*. Email: avelasco@marnr.gov.ve

NORTH AMERICA

Mexico

CROCODILE ATTACKS IN CANCUN. During the last 6 months there have been 7 crocodile attacks on people in Quintana Roo, six in the Nichupte Lagoon in Cancun, another in the Sian Ka'an Biosphere Reserve, 150 kms south of Cancun. All the victims were involved in fishing (4) or spearfishing activities (3) and were either in the water swimming and carrying fish or fishing on the water up to their knees or waist. None of the attacks resulted in a fatality. Four victims suffered severe wounds (arms and legs) but recovered with no permanent damage other than body scars, one lost part

of a foot; one had minor scars in the head and ear and another resulted in no injuries since the crocodile bit his diving fin and was then punched away with a spear gun by a colleague.

In coordination with government authorities, we have captured and sent to Crococun (a crocodile farm on the outskirts of Cancun) two *Crocodylus acutus* that were being fed fish at night 30 meters away from where two of the attacks took place. One is a 2.50 m female and the other one was a 1.55 m female. The injuries of the attacks seem to match with the size of the crocs caught on each instance, as well as with the description given by the victims.

The maximum number of crocodiles believed to have been involved in the 6 attacks in Cancun is three. The first two attacks occurred in the same spot, a canal 5 meters deep 15 to 20 meters wide, surrounded by red mangroves with crystal clear water. These two attacks took place one day apart from each other, the first victim was again snorkeling and spearfishing the following day this time with his partner who's fin was bitten. The following two attacks occurred in the opposite extreme of the Lagoon approximately 12 Km from the first, three months later. These took place under the same bridge late at night, one week apart from each other. In both instances the victims were fishing on the water edge in positions that made them look much smaller than they actually were. The 5th and 6th attacks occurred at another single spot one day apart from each other. The 5th victim we know little of since this person left to seek medical attention in another state, but is known to have lost part of his foot. The 6th victim was fishing and was almost completely under water (only his head was on the surface) when the croc grabbed him by the head. This person was trying to unhook his fishing gear from stones in the bottom of the water and this attack took place in the afternoon around 2 p.m. The attack that took place in Sian Ka'an was to a woman who was spearfishing with her lover in a coastal lagoon. The man was carrying the speargun and she was snorkeling behind him with fish on her back. The crocodile again grabbed this woman by the head. We haven't been able to get any details on this one since neither he or she want to comment on the subject (as they are both married to someone else). The species involved in this attack was almost certainly *C. acutus*. Four of the victims may have been confused by crocodiles as smaller prey since they were almost completely submerged in the water and were initially attacked on the head. The factors in these attacks include the following:

1. Recently have been fed in the Nichupte Lagoon by restaurant owners/workers and marina operators because this is an attraction for the public and it is also seen as an action of good human nature. As you all know crocs become attached (conditioned) to humans which are seen as a food source or plain food.
2. Fishing is illegal in certain parts of the lagoon, however, the economic situation that Mexico is going through has promoted an increase of subsistence fishing increasing the probabilities of crocodile encounters.
3. In Mexico, crocodiles have been legally protected for the last 30 years. Historically crocodile populations in Quintana Roo were not heavily exploited and illegal extraction-hunting has been almost non existent. Since the 1980's crocodiles were "common" in the state. Therefore a population increase is assumed to have occurred, as well as an increase in the number of animals in the larger size classes. Our 7 year capture-recapture study in Sian Ka'an strongly supports this assumption for Cancun.
4. Although a vast system of protected areas exists in the state of Quintana Roo (probably the largest in the country), in the lagoon crocs have lost habitat to tourist development, particularly *C. acutus*.
5. Four of these attacks (the most severe ones) have occurred during the mating-hatching season, a period of time when crocodiles are more active and aggressive.
6. This year has been dry and warm. Most of the freshwater swamps (typical Morelet's habitat) connected to the lagoon are completely dry, thus an increase in crocodile densities (*C. acutus* and *C. moreletii*) in the lagoon is also expected to have occurred.
7. Environmental conditions in the Nichupte Lagoon have been drastically altered over the last 20 years including reduced vegetation cover, wetlands fragmentation, water circulation has been severely modified and bacterial and chemical contamination increased.

In the state of Quintana Roo, in previous years there have been three attacks in rural areas. In 1995,

one took place south of El Eden Ecological Reserve. A campesino was fishing on a pond with water to his waist when he found a hatchling Morelet's crocodile and grabbed it. An adult crocodile (presumably the female) responded to the distress calls of the hatchling and bit the guy on his hand (as he was releasing the hatchling in the water) and then bit his thigh. In 1994, a campesino was fishing at Laguna Muyil within the Sian Ka'an Biosphere Reserve late in the afternoon, up to his waist in the water and had fish hanging on the side of his hip when he was grasped from behind by a crocodile which bit him on the head and legs. Two years earlier, 1992, his brother had been attacked under the same conditions and in the same spot by another crocodile (highly likely the same animal). In all three cases the species involved was *C. moreletii*.

In previous years the appearance of crocodiles in Golf courses, crossing Cancun's main avenue, or showing up on the beach of some fancy hotel have been common events on the local newspapers. An increase on this sort of event has been occurring. In some instances animals have been captured and returned to their natural environment; in others they have been either sent to captivity (farms or zoos) or "relocated" (without any biological basis) to other pristine areas; others were killed by cars as they try to cross the Hotel Zone main avenue.

All seems to indicate that crocodiles are beginning to be too many for their own good. Trying to anticipate this situation, at the beginning of this year I had proposed within the Mexican Crocodile and Caiman Conservation National Plan, among other subjects, the inclusion of an Educational Campaign. I have published an article dealing with the subject, and explaining why crocodiles should not be fed or disturbed. The document entitled "Aprendiendo a vivir con los cocodrilos" (Learning to live with crocodiles-based on the Australian campaign) has been put out in the official bulletin of the Federal Government (through SEMARNAP our Wildlife Management Authority) for the state of Quintana Roo.

Nevertheless, municipal, state and federal authorities have a tremendous amount of pressure from tourism operators, the media and the public in general. It is important to mention that of the seven attacks only three have been reported on local newspapers. That means there is a strong pressure over three known attacks when seven have occurred. In one of the low income urban areas a mass hysteria is gradually developing because of the presence of crocodiles in a canal across the street from a suburb. Although no attacks have occurred there, people are telling stories about the crocodiles eating dogs and are demanding the removal of crocodiles from the area. In the meantime some people try to feed them while others throw stones at them. Although not verified, municipal authorities in the ecology department believe that two crocodiles have been shot by local people in the Lagoon.

In the state, a committee has been formed in order to address this situation in Quintana Roo integrated by federal, state and municipal government authorities, NGO's and the private sector involved with crocodile research, conservation or management.—Marco A. Lazcano-Barrero, *Director General Reserva Ecologica El Eden, A.C. Apdo. Postal 770 Cancun, Quintana Roo 77500 MEXICO* .

CROCODILE MEETING IN CHIAPAS. The first state meeting for the formulation of a program for the conservation of crocodilians in Chiapas (southern Mexico) was convened 29- 30 November 1996 by the Miguel Alvarez del Toro Zoo (ZOOMAT), the breeding center Cocodrilos de Chiapas (COCOCHIS) and Banana Safari and Chula Zoo (BSCZ). The meeting was opened by Biol. F. Esquinca Cano, secretary of Ecology, Natural Resources and Fisheries. Also invited to the inauguration was Biol. Jose Juan Perez Ramirez of Instituto Nacional de Ecologia and coordinator of the National Strategy for Conservation of Crocodiles in Mexico, Antonio Mier Ponce, director of Veterinary Medicine at the University Autonoma de Chiapas, Biol. Carlos Guicard Romero, director of

ZOOMAT and Arch. Manuel I. Muniz, director of COCOCHIS and BSCZ. The meeting was opened with a video commemorating the life of Miguel Alvarez del Toro and the meeting was dedicated to his memory.



Chiapas meeting (front to back, left to right). M. Muniz, G. Iturbe, F. Rodriguez, J. Martinez, J. Perez, M. Lazcano, O. Gordillo, A. Isaias, B. Burquete, H. Mandujano, R. Cruz, Y. Mari, J. Gallegos and Luis Sigler with their daughter Yunuen.

Presentations were received on the Mexican National Crocodile Conservation Strategy (J. J. Perez); Wild Populations of crocodilians in Chiapas (L. Sigler); Conservation of *Crocodylus acutus* in Sumidero Cañon (L. Sigler); Fishing activities and effects on *Caiman crocodilus* and *C. acutus* in la Encrucijada Biosphere Reserve (J. Martinez Ibarra); Restocking and Conservation of *C. moreletii* in Juarez County, Chiapas (Carlos Guichard Romero) and Experiences breeding *C. moreletii* in Tapachula, Chiapas (M. Muniz).

Following this workshops were held. The first was 'Legal Aspects Surrounding Crocodilians' by J. J. Perez, Armando San Martin and Romel Velaquez representing federal and state regulatory agencies and covering wide aspects of international and national requirements for permits for research, sustainable use, farming and ranching. The second workshop was 'State Commission for the Conservation of Crocodilians in Chiapas' directed by L. Sigler. The workshop concluded by defining four regional subdivisions in the state, assigning representatives for each region and proposing a mechanism for more accurate information flow on crocodilian conservation, trade, illegal traffic and other topics. A third workshop directed by Juan Alonso Isaias Moreno gave a brief history of the Patate Aqua Culture Center. The center was originally built to breed Morelet's crocodile but was unsuccessful and converted to exotic fish culture. However current plans are to re-establish crocodile breeding of local *C. acutus* and *Caiman crocodilus* with the participation of rural communities.

The second day of the meeting was applied to the elaboration of conclusions and a document. Major conclusions were 1) That it was possible to convene a meeting of government agencies and crocodile specialists for discussion on crocodile conservation. 2) That the National Strategy for the Conservation of Crocodiles in Mexico was now understood and that the state of Chiapas has great importance due to the presence of three crocodilian species. 3) That the State Commission for the Conservation of

Crocodylians would form the basis for expert advice on crocodiles and would support sustainable use projects requested by the Chiapas state government. 4) That a basis for a second meeting was established where some additional components of a state strategy for crocodile conservation will be discussed.-- Luis Sigler, *Instituto de Historia Natural. A.P. 6, Tuxtla Gutierrez 2900, Chiapas, Mexico.*

United States

CROCODILES CONTINUE COMEBACK. Record numbers of crocodile nests have been found this year in Everglades National Park and at Florida Power and Light's Turkey Point Power Plant, said Frank Mazzotti, assistant professor of wildlife at the University of Florida. In addition, two crocodile nests were discovered on Cape Sable, the first seen there since 1897. And, on Sanibel Island near Fort Myers, crocodile nests were seen for the first time. "What we are seeing is a marked success of crocodiles in Florida. This is an endangered species success story," said Mazotti. Over the last 15 years the number of nests in Florida has doubled.

From April through August, Mazotti and his colleagues have searched known and potential nesting habitat looking for signs of crocodiles and nesting activity. At Turkey point they found 17 nests and tagged 307 hatchlings. The previous record was 12 nests. In the Everglades they found 21 nests. They plan to measure growth and survival rates by capturing and marking crocodiles and following up with periodic recaptures. More than 700 crocodiles have been marked in the Everglades and more than 2,000 in south Florida.—*from UNIVERSITY OF FLORIDA DIGEST, Gainesville FL 32601, USA.*

CLARIFICATION OF REGULATIONS. The new regulations allowing importation of Nile and Saltwater crocodiles into the USA (50 CFR Part 17 Sec. 17.42) require each whole crocodile skin to be tagged in accordance with CITES resolutions (9.22 Universal tagging). The regulation also allows the importation of crocodile parts and pieces of skin. The wording of a crucial part of the regulation (Section 17.42 (c) i (3) B) is as follows, "Each crocodylian skin and each belly skin piece wider than 35 cm imported into or presented for export or re-export from the United States after July 24 1996, must bear: either an intact, uncut tag from the country of origin meeting all the requirements of the CITES tagging resolution, or an intact, uncut tag from the country of re-export where the original tags have been lost or removed from raw, tanned and/or finished skins."

Some readers have inquired whether this means that whole skins less than 35 cm width can be imported without tags, noting that many skins in trade are below this size. In conversation with the management authority and enforcement personnel they have clearly indicated that both the letter and intent of the regulation is that all whole skins, regardless of width, must bear a tag. In addition, incomplete or partial belly skins that are wider than 35 cm must also bear a tag, but pieces of belly skin less than 35 cm width may be treated as 'parts' and imported in transparent bags with a tag on the bag as described in Section 17.42 (c) i (3) A. Careful reading of the whole regulation and its rather complex organization confirms this interpretation, which is substantially in line with standard CITES regulations and CSG recommendations.—*Eds. (with thanks to Carol Carson, US CITES Management Authority, and Charlie Dane, US CITES Scientific Authority).*

FLORIDA ALLIGATORS FEELING CRAMPED. When a 7 year old boy fell off his bicycle into a ditch in the Everglades National Park, an alligator chomped on his arm and chest. In Tampa Bay, a

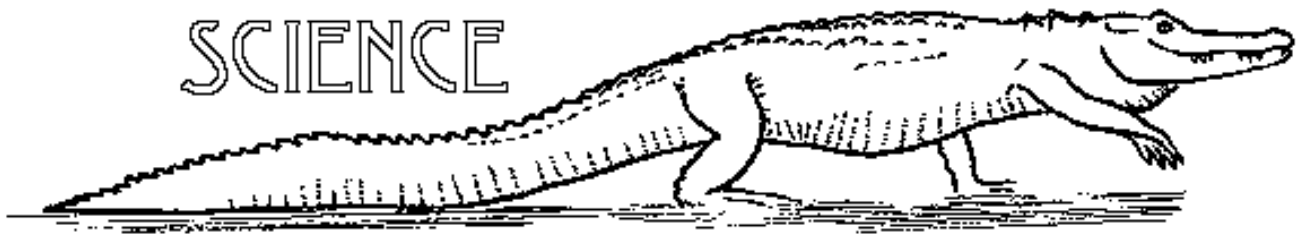
friend of Lester Smith used a bow and arrow to kill a gator that was creeping closer to his home. He faces up to five years in prison. Idling in North Florida's Tomoka river, Ray Smith felt his watercraft tip backwards. Teeth fragments and marks identified the attacker as an alligator.

These incidents exemplify a growing problem in one of the USA's fastest growing states. As more and more people move there, Florida's largest predators are clashing more frequently with people. With 800 to 1,000 people moving to Florida every day, large tracts of swamp and wetlands are disappearing to make room for homes, offices, schools and shopping malls. Last year the state fielded about 15,000 calls from residents wanting gators removed from their neighborhoods and State licensed trappers killed 4,000 of these. In addition nearly 7,200 alligators were harvested on State and private land under the legal harvest system.

As the shy but sometimes dangerous reptiles are forced to live close to humans, people are seeing the animals in urban lakes, canals and even their back yards. "Its not a case of alligators wandering into town, its a matter of towns popping up in alligator habitat," said a Game Commission spokesman. Florida's alligator population is steady at about 1 million and although off the US Endangered Species list, the alligator is still a protected species. The State tightly controls commercial alligator farming, regulates hunting and prohibits unauthorized killing. Normally alligators will peacefully share space with people but problems come when people feed them. "Be respectful of the alligator, it is a dangerous animal," warned Harry Dutton, an alligator expert with the Game and Fish Commission. Alligators have attacked humans 218 times, killing seven since the Game and Fish Commission began keeping records in 1948. Thousands of alligators have been killed by humans in the same period. Although some old time Florida residents lament that gators may become scarce, scientists don't think so as both Federal and State governments aquire and protect large areas of alligator habitat.—*from the AIKEN STANDARD (South Carolina) 30 August 1996.*

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SCIENCE



DYNAMICS OF EXPLOITATION OF ALLIGATORS. Exploitation of American alligator populations was investigated by viewing the dynamics of population level effects due to controlled harvest and uncontrolled environmental contamination. I found that alligator populations are resilient to exploitative stresses.

Alligator populations in two Florida Lakes were harvested at 50% of annual egg production from 1987 to 1991. No changes were found in numbers of juveniles. Numbers of adults and subadults size classes increased. A simulation model was developed to investigate changes in alligator population dynamics under various harvest strategies. The simulated population was very sensitive to errors in parameter values for fecundity and adult female survival and growth. Simulations predicted that a 50% harvest of eggs did not negatively affect population growth nor did a 10% harvest of adults. The model population decreased when exposed to simultaneous egg and adult harvests.

At another location, Lake Apopka, alligators are exploited through environmental contamination. Beginning in 1981, a major decline was observed in juvenile alligators on the lake. The total population decreased until 1989 and then increased through 1995. The number juveniles and clutch viability showed a similar pattern. However, clutch viability remains depressed compared to a reference area, Lake Woodruff. Size distributions of adult nesting females indicates that a portion of the continuing depressed clutch viability on Lake Apopka is attributable to adult female demographics. The loss of several cohorts to the acute effects of environmental contamination was implicated.

Although the alligator appears resilient to heavy exploitative pressures, ongoing monitoring programs should continue. Successful management programs will incorporate ecological constraints with all stakeholder groups involved in exploitation of the alligator.—*summarized from the Abstract, PhD Dissertation, DYNAMICS OF EXPLOITATION ON THE AMERICAN ALLIGATOR: ENVIRONMENTAL CONTAMINANTS AND HARVEST, 1996. Kenneth G. Rice, Wildlife Ecology and Conservation, University of Florida, Gainesville FL 32601 USA.*

TRICHOBEZOARIASIS IN MEXICAN CROCODILE HATCHLINGS. During 1995, the crocodiles hatched at the Miguel Alvarez del Toro Zoo were fed with domestic rodents produced in the facility. Beginning at five days of age, hatchlings were fed three times a week with finely chopped pieces of rat (*Rattus* sp.). To meet basic nutritional requirements the food included whole rats (hair, skin, meat, bones and viscera) in pieces no more than 1 cc volume. After two months we noted that two of the hatchlings were not growing and became thin and showed torticollis. We performed necropsies on four hatchlings and found trichobezoars (hairballs) of rat hair in all of them. These foreign bodies, occasionally surpassing a centimeter in length, reduce the gastric mucosa surface and obstruct the the passage of food, as some of them were bigger than half the gastric capacity. The diet was changed to chicken and fresh fish and bone finely chopped and the problem was controlled. It is possible that the presence of trichobezoars can provoke a syndrome of poor digestion and that hatchlings could die of starvation.—Luis Sigler, *Instituto de Historia Natural, Tuxtla Gutierrez, Chiapas, Mexico.*

GALLOPING CROCODILE FOSSIL. About 212 million years ago a small galloping crocodile roamed the flood plain that is now the Connecticut River Valley in Northeastern USA. The 3 inch skull of this creature was exposed in a road cut in March 1995 and after a year the the small bone has been dislodged and identified. The find was announced by paleontologist Paul Olsen of Colombia University, Hans-Dieter Sues of the Royal Ontario Museum and Mark Norrell of

the American Museum of Natural History. Part of the interest of the skull stems from the rarity of vertebrate fossils from the Mesozoic era in NE USA. The little crocodile seems to be closely related to a similar Mesozoic crocodile from Scotland called *Erpetosuchus* which is known only from a single body cast. The new find is from an animal about two feet long with long graceful legs with four toes on the hind limbs and five on the front. The very similar *Erpetosuchus* had armoured skin plates originally thought to be for defense, but now it looks as if they helped support the vertebrae assisting its upright stance. The little reptile walked upright on all four legs and was probably largely terrestrial. Present day crocodiles are thought to reach speeds of 15 miles an hour on land so this Triassic crocodile could probably reach higher speeds. In the Triassic, Connecticut and Scotland were adjacent parts of the same land mass.—from a *NEW YORK TIMES REPORT*, December 1996.

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.*

ECOLOGICAL STUDIES ON CROCODILIANS IN SURINAME. By Paul E. Ouboter, SPB Academic Publishing bv/ Amsterdam/New York: 139 p. This book is the result of many years of research into the ecology of caimans (*Caiman crocodilus*, *Paleosuchus trigonatus* and *P. palpebrosus*) in Suriname. Research started in 1982 when the Foundation for Nature Preservation (STINASU) wanted more information on the population of caiman at Cusewijn which had been hunted ruthlessly some years before. Paul Ouboter began the study with Lurly Nanhoe as an MSc. project. Between 1987 and 1991 the study was supported by a grant from the Netherlands Foundation for the Advancement of Tropical Research and later portions of the work received support from the Beyerinck-Popping Fund, The Foundation for the Advancement of Herpetology, The Foundation for Scientific Research in Suriname and the Netherlands Antilles, the Netherlands Foundation for International Nature Protection, the Society for Scientific Research in the Tropics and World Wildlife Fund (Netherlands). The work was undertaken initially with STINASU and the Surinam Forest Service and continued as part of the National Zoological Collection of Anton de Kom University of Suriname.

The book presents a case study of the first comprehensive investigation of niche segregation and competition in these crocodilians. Three species of crocodilians studied in Suriname have a high probability of interspecific competition due to their morphological similarity, high densities and syntopic occurrence in many areas. A case is presented which shows the complexity of a community consisting of only two or three members, a complexity stemming from the complicated life history of the organisms and the dynamics of their ecosystem.

Opening chapters lay a ground work of information about Suriname and its crocodilians and the possible dimensions of their competitive interactions. Chapters detailing methods, morphometric analyses, description of habitats, the distribution and abundance of the three species and their life cycles provide a wealth of basic data for analysis. Following chapters address habitat selection, the effects of temperature and salinity, and food selection. Two final chapters synthesize the information in a broad discussion of niche segregation and close with a discussion of the impacts of humans and the current status and conservation needs in Suriname.

The general conclusion that crocodilian species in Suriname minimize direct competition is not surprising, but the book provides a detailed insight into the subtle variations of life history, physiology and habitat preference that allows this to occur. Key factors turn out to be nest site preferences, thermophilic behaviour and tolerance to salinity. Direct aggression and interspecific predation are shown to be relatively unimportant. An additional result of interest is confirmation of the clear morphological and habitat differences between the two *Paleosuchus* species.

The book (paperback) is nicely bound and abundantly illustrated with professional quality figures and diagrams and some useful photographs. Three maps (figs 6.1, 6.2 and 6.3) provide the most detailed overview of distribution and relative density available for these species in Suriname. The only deficiency I saw was that a comparison of the reproductive ecology of the three species, and an analysis of population dynamics might provide additional insights into the competitive relationships, and this work no doubt remains to be done. A useful addition to any crocodile biologist's library, the book is distributed by SPB Academic Publishing, New York (fax 212 683 0118) and Amsterdam (fax 31 20

NEW YACARE PUBLICATIONS FROM BRAZIL. The Embrapa Group in Corumbá, Brazil, continues to produce valuable results from their ongoing studies of caiman in the Pantanal.

Santos, S.A, M. S. Nogueira, M.S. Pinheiro, Z. Campos, W. Magnusson and G. Mourao. 1996.
Diets of *Caiman crocodilus* yacare from different habitats in the Brazilian Pantanal. *Herpetological Journal* 6:111-117. Gives a valuable analysis of diet.

Coutinho, M & Z. Campos. 1996.
Effect of habitat and seasonality on the densities of caiman in southern Pantanal, Brazil. *Journal of Tropical Ecology* 12:741-747. Compares caiman surveys by night spotlight and aerial ultralight plane.

Together, these papers, with the earlier productions of this group, are laying a firm foundation of information on which management and conservation of yacare can be developed.—*Eds*.

MEETINGS

REGIONAL MEETING OF THE CSG FOR CENTRAL AMERICA AND THE CARIBBEAN. Following a preliminary invitation issued to the CSG issued at the 13th Working Meeting last May, a consortium of Mexican crocodile interests have combined to invite the CSG to hold a regional meeting with special emphasis on the Central American Region at Villahermosa in Mexico, 4-7 August 1997. The meeting organizers under the leadership of the Society for the Study and Conservation of Mexican Crocodilians (SECOCOM) have combined the resources of the Autonomous University Juarez of Tabasco (UJAT), the Mexican National Institute of Ecology, Industrias Moreleti, Cocodrilos Mexicanos, The Institute of Natural History of the Alvarez del Toro Zoo, Banana Safari and Chula Zoo and Cocodrilos de Chiapas to provide a broad base of organisational support for the meeting. An organizing committee based at UJAT is arranging local details and the CSG Executive Officer visited them in December to coordinate registration processes.

The Meeting will be held in Villahermosa, the state capital of Tabasco State in the Central Eastern Mexico. Villahermosa is located within extensive fresh wetlands and actually has a wild population of *C. moreletii* living in a lake in the city center. Villahermosa is close to the famous Maya ruins of Palenque and a short drive from the Centla Biosphere reserve, an outstanding wetland and crocodile habitat which will be the location of post meeting field trips. Facilities for the meeting are being provided by the Center for Investigation of Endangered Species (CICEA) of UJAT which is built around a 5 ha crocodile pond used to maintain all three Mexican species for research.



Crocodile ponds and Research laboratory at CICEA, UJAT, venue for the Regional Meeting, August 1997.

Objectives of the meeting are to exchange experiences and ideas for the conservation and sustainable use of crocodilians, particularly the three species found in Mexico; to establish a strategy of sustainable use for crocodiles as a method for the conservation of wild populations and their habitats; and to establish contacts between researchers, commercial interests

and government agencies to develop projects together. A call for papers will appear in March and it is the organizers' intention to receive completed manuscripts by June and to distribute the Meeting Proceedings at the meeting. Preliminary registration information is included with this Newsletter and potential participants should send their name and contact address to receive more detailed information and full registration instructions.

THIRD INTERNATIONAL CONGRESS ON WILDLIFE MANAGEMENT IN AMAZONIA, 3-7 DECEMBER 1997, SANTA CRUZ, BOLIVIA. The Congress, jointly hosted by Museo de Historia Natural Noel Kempff Mercado and the Tropical Conservation and Development Program, University of Florida, USA, will focus attention on the studies and programs of management which have recently been applied in the Amazon region. The Congress follows upon preceding Congresses in Brazil in 1992 and Peru in 1995 and will permit professionals and students to interchange new results and ideas for the management of wildlife in the region. Presented papers will be compiled in Proceedings. Preliminary discussions are underway to include a workshop on management of Amazonian crocodilians in 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, Email: tcd@tcd.ufl.edu*

CSG ON-LINE



NEW WEB PAGES. See Marco Lascano's pages for El Eden Ecological Reserve at: http://www.ucr.edu/pril/peten/images/el_eden/Home.html, <http://www.ucr.edu/pril/peten/images/proaft/PROAFT.html> and <http://www.iminet.com/mexico/eden.html>.

See Peter Freeman's home page for Hartleys Creek Crocodile Farm at: <http://www.hartleyscreek.com>.

CSG WEB REPORT. The CSG web pages at <http://www.flmnh.ufl.edu/natsci/herpetology/crocs.htm> continue to attract wide attention and positive comment. Contacts have continued to increase from 491- 683/month in July- September to 861-1,046/month in the October -December quarter. A number of people have contacted CSG indicating their interest in our material, and preference to receive their Newsletter directly on the web. A number of contacts from researchers and commercial interest have also originated from our web pages, including a stockbroker who made a donation of \$250! The crocodile photo gallery has generated several inquiries about using CSG images and we have decided to charge users a fee for one time use for any commercial purpose. The original photographers will be consulted for their approval in every case and if they choose may retain the fee or donate it to CSG. Non-commercial and research users should contact us for permission to use images without charge, although we would like to receive acknowledgement, along with the original photographer, as well as copies of the material.—*Eds.*

This historic photograph shows crocodile shooting in New



Guinea in the early 1960's aboard the 70 ton vessel M.V. Crocodillo with Skipper John Sweeney and native crew.—
submitted by Terry Selwood, Marine Leather Exports, P.O. Box 5348 Cairns, Qld. 4870, Australia

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

Preliminary Notice and Preregistration

**Regional Meeting for Latin America and the Caribbean
4 - 7 August 1997
Villahermosa, Tabasco, Mexico**

The Autonomous University Juarez of Tabasco, the National Institute of Ecology, the Society for the Study and Conservation of Mexican Crocodylians, Industrias Moreleti, Cocodrilos Mexicanos, The Institute of Natural History of the Alvarez del Toro Zoo, Banana Safari and Chula Zoo and Cocodrilos de Chiapas extends a cordial invitation to participate in this fourth Regional Meeting of the Crocodile Specialist Group.

Registration for the meeting has been developed at several levels and costs to encourage both national and international participants and students. Full registration will include the program, Proceedings, a T-shirt, local transport, welcome party, field visits, cultural presentations and a closing banquet.

To receive full registration details and additional information on the meeting, accommodations and venue, please return the information indicated on the following form.

PREREGISTRATION FORM
Regional Meeting for Latin America and the Caribbean

Name: _____

Institution/Company: _____

Postal address: _____

Telephone: _____

Fax: _____

Email: _____

I wish to attend the meeting as:

Full participant _____ Assistant _____ Companion/Spouse _____ Student _____

I wish to present an oral presentation _____ a poster _____

Please return to:

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