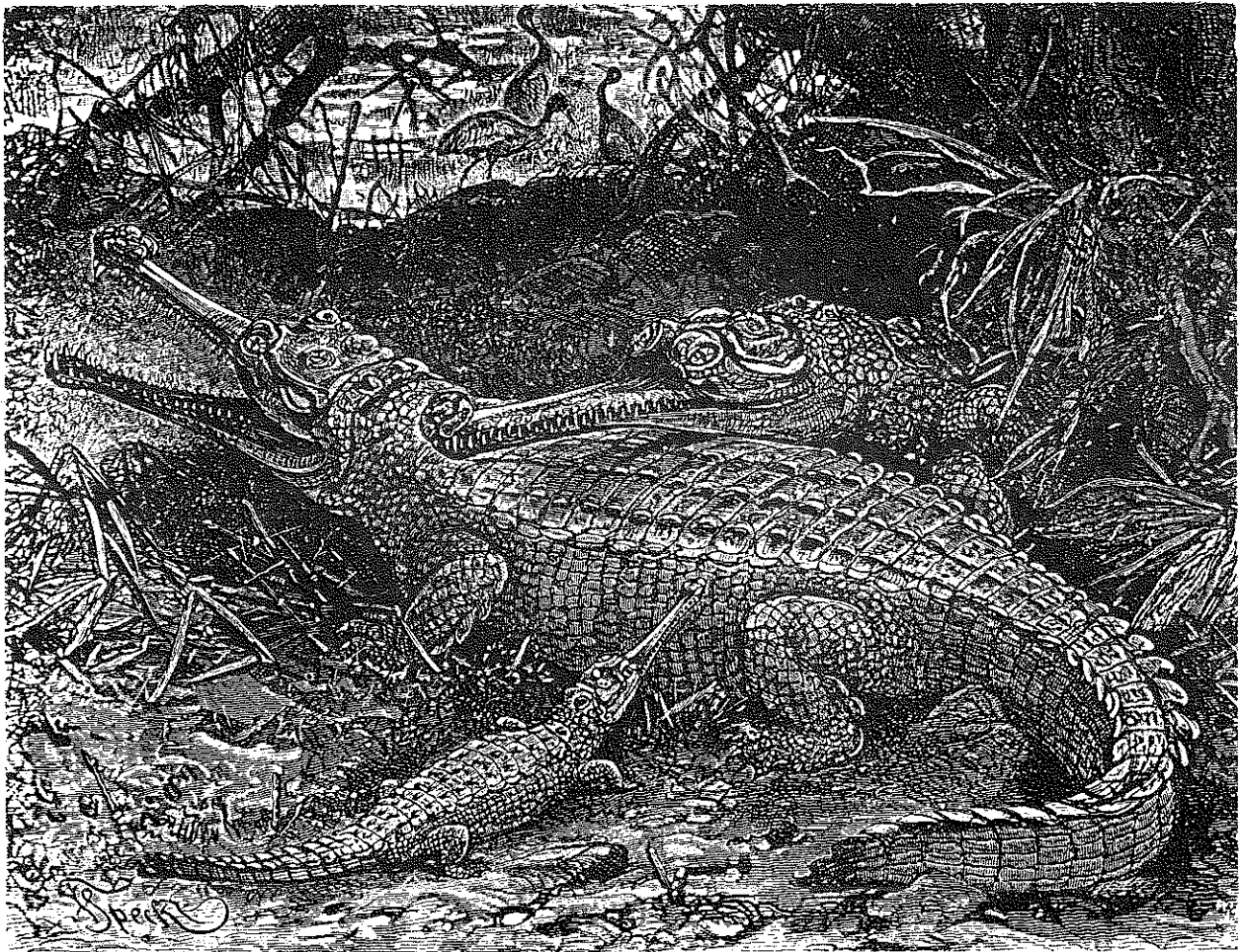


CROCODILE SPECIALIST GROUP

NEWSLETTER

VOLUME 8 ■ OCTOBER 1989 - DECEMBER 1989



International Union for Conservation of Nature and Natural Resources ■ Species Survival Commission

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International Union for
Conservation of Nature and
Natural Resources

Species Survival Commission

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CSG STEERING COMMITTEE

MINUTES OF THE 2ND MEETING OF THE
IUCN/SSC CROCODILE SPECIALIST GROUP
STEERING COMMITTEE - 8 OCTOBER 1989
WORLD CONSERVATION CENTRE
GLAND, SWITZERLAND

Present: Harry Messel, Wayne King, Ginette
Hemley, Ted Joanen, Juan Villalba-Macias,
Kevin van Jaarsveldt, Romulus Whitaker, Frank
Antram (TRAFFIC observer), Stephen Edwards
(SSC Executive Officer), Rene Honegger (CSG
observer), Noboru Ishii (CSG observer), Yoshio
Kaneko (CITES observer). Absent: Graham
Goudie, Laurie Taplin.

The CSG Chairman, Professor Harry Messel,
opened the meeting with a statement on new

procedures that, henceforth, would govern the operations of the CSG.

Minutes of Steering Committee meeting. The chairman informed the committee members that the minutes of this and all future Steering Committee meetings will be published in the issue of the CSG NEWSLETTER that immediately follows the meeting. This will keep the membership informed of the decisions taken by the committee. He asked Ginette Hemley and Wayne King to take notes which, when combined, will form the minutes of this second meeting.

The chairman then asked the committee members to suggest any corrections that might be needed on the draft minutes of the first meeting. There being none, the minutes of the first meeting were approved.

Governance of the CSG and the Steering Committee. The chairman announced that his method of chairing the CSG would be quite different from that of the previous chairman, and he intended to institute operating procedures which were more democratic, but which at the same time might appear less democratic, than past practices. Responsibility for virtually all CSG operations will be passed to the members of the Steering Committee. Their authority will only be exceeded by their responsibility. Each committee member will be responsible for all operations in his or her area of concern. All incoming inquiries and requests for assistance should be or will be directed to the appropriate committee member for response. The committee members will organize all contacts in his or her geographic region or area of special concern. In carrying out these duties, the committee members will act on behalf of the chairman, but will be responsible to the chairman. As set forth in the 'SSC Guidelines for Specialist Group Chairmen' (see CSG NEWSLETTER Volume 8, April-June 1989, pages 4-7), each committee member may speak on behalf of the CSG, but may not speak on behalf of the Species Survival Commission or the IUCN without prior clearance by these bodies. This decentralization of responsibility is much more democratic. However, the committee members serve the chairman, who in turn serves the SSC Chairman. They must keep the CSG Chairman completely informed of their important actions and promptly forward copies of all important

letters and documents to him. Any committee member who does not carry out these duties, who does not correspond, who does not respond to requests, who does not serve the members in his or her area, who acts irresponsibly, or who places the CSG or its chairman in an untenable position will be removed. This might appear to be less democratic, but it is essential for the smooth operation of the CSG as now constituted.

Membership and Representation. The chairman reminded the committee members that comments had been solicited from the members on how the Group should be changed (see CSG NEWSLETTER Volume 8, April-June 1989, page 3). The chairman was appreciative of the many comments he had received from the members. All the comments had been duly considered and had been invaluable in helping the chairman reorganize the structure of the CSG. After much deliberation, the chairman decided that henceforth, the CSG will have no 'Members.' The group will be made up of entirely of 'Correspondents' from which 'Officers' will be chosen by the CSG chairman. These officers shall serve as the Steering Committee of the CSG. In addition, the CITES Secretariat will be invited to provide someone who can attend as an observer, and the Chairman and Deputy Chairman of the SSC will automatically be on the Steering Committee. The vice-chairmen will have primary responsibility in their area of concern and will attend the Steering Committee meetings. The deputy vice-chairmen will assist the vice-chairmen and will serve as alternates who attend committee meetings when vice-chairmen are unable to do so.

This ends the past confusion over who is a member and who is a correspondent. Anyone who is interested in crocodile biology, conservation, sustained yield management and utilization of the crocodile resource is eligible to be a Correspondent, and their names will be recommended to the CSG Chairman by the Vice-Chairman. The Chairman may add other names or make deletions when he deems it appropriate, and then will forward the final list to the SSC Chairman and Executive Officer for processing. Correspondents will be obliged to contact the CSG through their Vice-Chairman (with a copy to the CSG Chairman) at least once a year with information about what they are doing or what is happening with crocodilians in their region or area of concern; research,

management, farming, ranching, or trade. They also must provide up to date addresses, telephone and fax numbers. At the end of each calendar year, the list of Correspondents will be purged of those individuals who have not contacted the CSG in this manner in the last 12 months.

The Vice-Chairman for Science is a new area of responsibility for the Steering Committee and was established in recognition of the importance of science to the work of the group. The expertise of the CSG is built on science.

All officers of the CSG/Steering Committee, with complete addresses, telephone and fax numbers, will be listed inside the back cover of the NEWSLETTER along with a statement that all inquiries should be directed to the appropriate officer.

[Subsequent to the 8 October 1989 Steering Committee meeting, the officers listed on the inside backcover were recommended to the SSC Chairman for appointment.]

The chairman indicated that some people might complain that some of the officers should not have been appointed because of their past involvement in some activity or other, but that he was not particularly interested in the past history of the officers. What he was interested in was the work the officers were going to do for crocodilian conservation and for the CSG. Any officer who does not work for conservation and the sustained yield management and utilization of the crocodile resource, or who violates the trust that accompanies appointment as an officer, will be removed.

One of the duties of the officers will be to collect an annual summary of conservation activities from each CSG Correspondent in their area of concern. These one-page summaries will be forwarded to the CSG Chairman for use in the NEWSLETTER and for compilation into a worldwide atlas of crocodilian conservation. As stated previously, if such a page is not presented annually and before 31 December of each year for a correspondent, the correspondent's name will automatically be dropped from the CSG Correspondent list.

Patrons. There will be one additional new category of CSG affiliation, 'Patrons.' People and/or organizations will become Patrons annually when they contribute money annually to the program and work of the CSG. The list of Patrons will be published inside the front cover

of the CSG NEWSLETTER in recognition of that support. The order in which they are listed will reflect the amount of money they contributed that year; the largest total contribution first and the smallest last. The names will be listed alphabetically when the contributions are of equal size.

The chairman then invited comments on his reorganization plan from the Steering Committee members present.

Stephen Edwards, SSC Executive Officer, indicated that the model was good, almost idealistic. He noted that passing responsibility to the Vice-Chairmen and Deputy Vice-Chairmen was in keeping with IUCN's goal of regionalization of IUCN, with local members responding to a regional office. However, he envisioned practical problems associated with maintaining records of all the Correspondents, if they are to be put on the mailing list for the SSC newsletter, SPECIES.

The chairman stated that the Vice-Chairmen and Deputy Vice-Chairmen would provide the Chairman with comprehensive lists of Correspondents, with complete addresses, telephone and fax numbers, who would pass them on to the SSC Chairman and SSC Executive Officer.

[As set forth in the 'Guidelines for Specialist Group Chairmen' (see NEWSLETTER vol. 8, April-June 1989, p. 5), the term of the Correspondents will run from one IUCN General Assembly (GA) to the next. However, they can be appointed at any time so it is not necessary to wait until the next GA. Correspondents will be nominated at the 21 April 1990 Steering Committee meeting. That list of nominees, as amended by the CSG Chairman, will then be forwarded to the Chairman of the Species Survival Commission (SSC) for his review and approval. At the moment, Vice Chairmen and Deputy Vice Chairmen are busy drawing up lists of Correspondents to be nominated at that meeting. These Correspondents will serve in the interim until their appointments are approved by the chairman of the SSC.]

Stephen Edwards also worried about policy statements coming from Vice-Chairmen. He indicated that Vice-Chairmen can speak on behalf of the CSG, but could not speak for the SSC or IUCN without first passing on to the SSC Chairman and the IUCN Council any policy statements that might impinge on IUCN/SSC

policy. In addition, copies of any such statement that overlaps with IUCN/SSC policy should be sent via the CSG Chairman to the SSC Executive Officer so that IUCN is kept informed of current issues and developing policy.

The chairman agreed with this, stating that the Vice-Chairmen and Deputy Vice-Chairmen will only speak for the CSG, and any time an issue arises that might have implications beyond the work of the CSG, they must forward it to the CSG Chairman for action, including passage on to the SSC Chairman. Should the issue involve IUCN policy, the SSC Chairman will pass it on to IUCN. With 104 specialist groups and 2,300 members, the SSC Executive Officer would be inundated with unnecessary correspondence unless it is filtered through the specialist group chairman and commission chairman.

Stephen Edwards indicated that species are now more important within the program of IUCN, not only because species are important in their own right, but also because the public does not relate to issues such as biodiversity. They relate to species such as tigers, mountain gorillas, elephants, rhinoceroses, and crocodiles.

The chairman indicated that decentralization must occur if services are to be delivered to the members and the public in a timely and professional manner. Too many requests for assistance are received for any one individual to handle.

The deputy chairman, Wayne King, indicated that to be effective, the Vice-Chairmen and Deputy Vice-Chairmen must have access to telephones and fax machines. Presently one officer, Romulus Whitaker, has neither a telephone nor a fax and cannot be reached except by mail, which was slow.

Rom Whitaker responded by stating he had established an office in Madras and soon would have a telephone and fax.

Rene Honegger asked which Vice-Chairman would have responsibility for overseeing non-commercial captive-propagation of endangered crocodilians such as is carried out by zoos in Europe and North America. For example, the American Association of Zoological Parks and Aquariums has a Crocodilian Advisory Group (AAZPA/CAG) that coordinates an active North American program for breeding endangered crocodilians. Which Vice-Chairman should the AAZPA/CAG work through?

The chairman responded that the Vice-Chairman for Trade could handle non-

commercial propagation efforts along with commercial farms and ranches.

Ginette Hemley indicated that the Vice-Chairman for Trade Monitoring would be a more appropriate individual to handle non-commercial propagation programs.

Stephen Edwards revealed there was a major interest in coordinating with zoos since the SSC already has a number of conservation projects in concert with zoos.

[Later, outside the meeting, the chairman indicated that Dr. Valentine Lance, Deputy Vice-Chairman for Science, could handle zoo breeding programs since he was on the staff of the San Diego Zoological Society which is a member of the AAZPA/CAG.]

The chairman asked the committee if one vice-chairman and one deputy vice-chairman was sufficient for Trade.

Kevin van Jaarsveldt responded by stating that both buyers and sellers should be represented because their concerns were so different. He also stated that the Japanese trade was important but was separate from the European and the North American trade.

Ted Joanen suggested that Don Ashley would be a good person to handle trade in North America.

The chairman indicated that he might increase the number of Deputy Vice-Chairmen in the future if additional coverage was needed.

Wayne King stated that there should not be so many officers that the Steering Committee becomes cumbersome.

Kevin van Jaarsveldt pointed out that Regional Vice-Chairmen could assist the Trade Vice-Chairman on trade issues in their geographic areas.

The chairman then indicated that he would appoint both a European and a Japanese Deputy Vice-Chairman for Trade.

Crocodile proposals that are on the agenda of the 7th Meeting of the Conference of the Parties to CITES. The ten crocodile proposals submitted for CITES consideration were reviewed; four seeking annual quotas without data on the status of the wild populations, one seeking an extension and expansion of an existing quota, and five seeking permanent transfers of their crocodile populations to Appendix II. Ginette Hemley opened the discussion of each of the proposals summarized below with a review of its strengths and its shortcomings.

Botswana is seeking to maintain its Nile crocodiles on Appendix II under provisions of Conf. 3.15 on Ranching. The proposal should be rejected because Botswana still has a reservation on the Nile Crocodile. Also, at the time the proposal was submitted, Botswana had not sent CITES the annual reports on its trade in crocodiles for 1986 and 1987 as required by Conf. 5.21; the population data are inadequate; and there is no good evidence of population trends. In addition, Botswana continues to export wild-caught adult crocodiles to South Africa and Namibia. The two croc farms in Botswana are registered as captive-breeding operations, so they will not be impacted by rejecting this proposal. Ranching should be encouraged and no quota allowed for marketing large hides or adults from the wild.

Stephen Edwards reminded the committee that a CITES Party that has a reservation in an Appendix I species can only export the species to a non-Party state or to another Party that has a matching reservation. He then asked where the Nile crocodiles were going, who was buying them?

Kevin van Jaarsveldt revealed that permits are not required for shipments between Botswana, Namibia, and South Africa because they share a common Customs boundary.

Rom Whitaker stated that the European Economic Community was supporting the proposal.

In response to that statement the chairman reminded everyone that the CSG will base its decision on scientific evidence and not on the decision of nations or intergovernmental bodies. He then asked Wayne King to speak for the CSG at the CITES sessions.

Kevin van Jaarsveldt stated Botswana's ranching proposal should be accepted, but the harvest of wild hides should be rejected in favor of ranching. In addition, Botswana must withdraw its reservation.

The committee members decided that the Botswana proposal should be rejected for the reasons stated above. However, if Botswana drops its reservation, the CSG will support a quota for ranched hides.

Kenya is seeking to maintain an annual export quota of 5,000 hides under Resolution Conf. 5.21. No supporting data accompanied the proposal, no population surveys. Two farms are established in Kenya, one of which has been operating more as a ranch than as a closed-cycle

operation. The proposal contains no information on any management program. Kenya should be encouraged to develop data on its populations and to submit a ranching proposal under Conf. 3.15 at a later date. The present proposal should be rejected or reduced.

The chairman stated that the lack of scientific data was sufficient grounds for rejecting the proposal.

Stephen Edwards revealed that the IUCN ANALYSES OF PROPOSALS TO AMEND THE CITES APPENDICES recommended the rejection of a number of proposals because they lacked scientific data. IUCN depends on good science.

Kevin van Jaarsveldt suggested that Kenya should be given a quota only for ranching. In addition, information should be made available on how many hides the Kenya farms are capable of producing. That number should then be deducted from the Kenya quota. If this is not done, unscrupulous individuals might attempt to move skins from other nations through the Kenya ranches.

Ginette Hemley indicated that Kenya's exports have not filled the CITES annual export quotas already assigned. Most exports have involved live animals -- 150 adults to a farm in Israel.

The chairman stated the CSG is prepared to help countries like Kenya, but only if they help themselves by demonstrating an interest in scientific management of the wild population.

The committee then recommended rejection of the Kenya proposal in favor of an annual quota involving only ranched hides, no direct removal of hides or adults from the wild.

Madagascar is seeking to retain its crocodile population on Appendix II under the provisions of Conf. 3.15 on Ranching. The annual export quota that Madagascar received in Buenos Aires (1985), and that was renewed in Ottawa (1987), has hurt the wild populations. The quota was for 1,000 skins a year, except for 1988 when a special quota was granted for 3,784 skins, therefore the total 1985-1989 approved quota was for 7,784 skins. During this time, 17,500 crocodiles were killed in Madagascar, mostly for the local market for manufacture into artisanal goods for sale to tourists. The proposal indicates there is no evidence of illegal trade, yet the tourists are not required to have export permits. The proposal should be rejected.

Kevin van Jaarsveldt agreed that the proposal should be rejected and indicated that large

numbers of vegetable tanned products are leaving Madagascar as tourist items. The Madagascar crocodiles could be returned to Appendix I.

The chairman stated the CSG should reject the proposal in favor of retaining the population on Appendix I.

Stephen Edwards asked whether retention on Appendix II with a zero quota be better than transfer to Appendix I?

Ginette Hemley stated that Appendix I gives stronger protection. She also indicated that an FAO crocodile management project will soon start in Madagascar.

Rom Whitaker commented that Olivier Behra will head the FAO project.

The committee agreed that the Madagascar proposal should be rejected and the population returned to Appendix I.

Malawi is seeking to retain its crocodiles on Appendix II under provisions of Conf. 3.15 on Ranching. This is a good proposal with a conservative quota.

The chairman stated that Malawi should protect its breeders by stopping all hunting of wild adults. An upper size limit should be established which would protect the breeders.

Kevin van Jaarsveldt suggested that quotas for wild and ranched skins must be separated.

Ginette Hemley agreed that hides exported under a quota that is divided into ranched and wild hides, as the 1987-1989 quota for Malawi has been, should specify whether the individual hides are ranched or wild.

Stephen Edwards suggested that the CSG should make a statement at the CITES conference to the effect that hides should not be taken directly from the wild except where the population has been downlisted to Appendix II on the basis of the Berne criteria, but that an annual export quota for ranched hides could be specified under Conf. 5.21.

The chairman agreed and indicated that the CSG review of every crocodile proposal should be consistent on this point.

Ginette Hemley stated that Malawi should specify how many hides will be taken during the next four years.

Kevin van Jaarsveldt reiterated that the CSG should encourage the ranching of crocodiles and the prohibition of the commercial hunting of adults. No hides should be taken directly from the wild.

Wayne King reported that some African

nations that have CITES annual export quotas under Conf. 5.21 inadvertently have sanctioned excess killing of crocodiles. Since large hides bring higher prices than small hides, hunters were encouraged to kill as many crocodiles as they could and then discard the smaller hides. This has resulted in two to three times more crocodiles being killed than is allowed in the quota.

Ginette Hemley reminded the committee members that Jon Hutton had addressed this problem in his draft resolution on annual quotas. The draft indicates the kill quota must be equivalent to the export quota.

Kevin van Jaarsveldt stated the Malawi proposal should be rejected in favor of a ranching quota for its crocodiles.

Wayne King indicated that it would be easier to monitor hide exports if the records included data on numbers and sizes of hides.

Both the chairman and Kevin van Jaarsveldt responded by pointing out the obvious, current sales practices mandates data on the size and numbers of the hides sold, therefore there is no excuse not to include these data in all reports on exports. In addition, all hides in international trade should be tagged with the standard self-locking CITES tag. If this was done, only illegal hides would be untagged.

Several committee members suggested that some hides might be available from wild adults as a result of eliminating nuisance crocodiles that prey on people and livestock. Conservation might be served better if these adults were captured and placed in a farm rather than killed.

Ted Joanen stressed that in the U.S.A. large mature nuisance alligators are not captured for placement on farms because past experience has shown these animals fight excessively and disrupt the breeding program. In the wild these animals defend large territories and they do not easily adapt to less space on farms. By contrast, animals hatched and raised in captivity do not require large territories and as a consequence they fight less.

The committee agreed that Malawi should be encouraged to stop killing adults in favor of collecting wild eggs for ranching.

Tanzania seeks an increase in its annual export quota established under Conf. 5.21. Tanzania did not submit any supporting data with its proposal, and has not complied with Conf. 5.21, has not reported on its exports, has not established a monitoring program, and has

not implemented a management scheme. The proposal should be rejected and the population returned to Appendix I, or the population should be retained in Appendix II with a zero export quota. In either case, the CSG is willing to assist the government of Tanzania to develop a good management program which could be approved by CITES.

Mozambique seeks retention of its crocodiles on Appendix II pursuant to Conf. 3.15 on Ranching. There is no evidence of illegal trade out of Mozambique. Reports on exports indicate the export quota was unused in 1985 and nearly so in 1986. Data on the 1987-88 exports have not been received. Neither is there evidence that the quota has resulted in excessive numbers of crocodiles being killed.

The committee agreed that Mozambique should be encouraged to end the hunting of wild crocodiles in favor of collecting eggs for ranching.

Somalia seeks an annual export quota of 2,000 crocodile hides under the provisions of Conf. 5.21. Information supplied with the proposal suggest a wild population of between 6,000 and 344,900 crocodiles in the Jubba River. This is based on extrapolating from five aerial surveys that counted between 200 and 3,500 crocs in the river. Clearly such wild estimates are no basis for establishing an export quota of 2,000. No management program is established, and there should be a demonstration of management before a quota is given. A much smaller annual quota is recommended, possibly 200, while Somalia moves toward a ranching scheme.

The committee agreed the Somalia proposal should be rejected in favor of a quota for the annual export of ranched hides.

Ethiopia seeks an annual export quota for its crocodiles under Conf. 5.21. Ethiopia is a new Party to CITES, its membership becoming effective on 4 July 1989. Information provided on the status of the Ethiopia's wild crocodiles suggests the population is healthy. A ranching operation is established, though there may be a problem with providing sufficient food for the stock of animals already held.

The committee agreed to support the Ethiopia proposal if it can be amended to allow collection of eggs for ranching and end any killing of wild adults.

Zambia requests retention of its crocodiles on Appendix II under provision of Conf. 3.15 for Ranching. As a result of several populations

being depleted under the present CITES annual export quota which includes 2,000 wild hides, Zambia shut down all wild harvest and revoked all croc hunting licenses and switched to ranching. The private ranching operations are operating successfully. Zambia has not fulfilled its annual reporting requirements under Conf. 5.21.

The committee agreed that we should support Zambia's proposal because the government has ended the killing of wild adults and is allowing only the collection of eggs for stocking ranches.

Indonesia wants to keep its populations of *Crocodylus porosus* on Appendix II under provisions of Conf. 5.21 but with an increase in the annual export quota from 4,000 to 6,000. At the time the proposal was submitted, it contained no information on the size of the wild population. In addition, illegal trade through Singapore is uncontrolled. Indonesia reported fewer than 2,000 hides were exported each year under the quota, but data indicates that between 5,000 and 7,000 hides were shipped to other CITES Parties. The proposed increase in the export quota is supposed to eliminate some of the illegal trade. The Indonesian proposal should be rejected for lack of data.

Yoshio Kaneko suggested that rejection of the Indonesian proposal might be counter-productive as it would put all the trade in the hands of the illegal dealers.

Frank Antram stated that the Indonesia wildlife management office had a new person at its head. This should change the method of operation. Rejection of the proposal might discourage any improvements in operations.

The chairman indicated that the crocodile proposals from Indonesia are always poor, and never seem to improve. He is in favor of rejecting the present proposal.

Rom Whitaker stated that Jack Cox, who is in charge of the FAO crocodile program in Irian Jaya is working against great odds and nevertheless is doing a good job.

Wayne King added that in the past, the wildlife officials in Bogor, Indonesia, had communicated far too little with the FAO project in Irian Jaya.

The committee agreed the Indonesia proposal should be rejected.

[These decisions of the Steering Committee on the CITES proposals were negotiating positions. In some instances, new data that only

became available at the CITES conference forced changes in the Steering Committee recommendations outlined above. For example, Jon Hutton arrived at the conference with advance copies of CITES AND THE NILE CROCODILE IN EAST/CENTRAL AFRICA AND MADAGASCAR: THE CITES NILE CROCODILE PROJECT, a report to the CITES Secretariat on the status and management of the crocodile populations in Botswana, Kenya, Madagascar, Malawi, Mozambique, Tanzania, and Zambia. Data contained in this report, together with agreements arrived at following discussions with heads of delegations, allowed the CSG to support particular proposals after they were amended in committee or on the floor of the plenary session. The actions taken at the CITES conference are described by Ginette Hemley in CITES MEETING SUMMARY, page 11, below.]

Marking of crocodile hides. Frank Antram reported that Document 7.3 for the CITES conference contained a resolution that would require that all ranches, farmed, annual export quota, and look-alike species be marked with a tag approved by the CITES Animal Committee.

The committee members reiterated the CSG's goal of having all crocodile hides in international commerce tagged. However, the members felt the tagging requirement for hides should apply only up through tanning. Marking of retail products would be too cumbersome, though retailers and manufacturers should be required to maintain sufficient records to provide law enforcement officials with a 'paper trail' on the origin of all crocodilian products.

That concluded the committee discussion on CITES proposals.

10th Working Meeting of the CSG. Wayne King reported on the preparations for the 10th Working Meeting which is scheduled for 23-27 April 1990, in Gainesville, Florida, U.S.A. The committee was reminded that this date was fixed at the first Steering Committee meeting upon the recommendation of the hosts -- April is the month that least conflicts with activities in the Florida alligator management program.

Because conference space is not available on the University of Florida campus at that time, the meeting will be convened off campus, in the Holiday Inn West. Rooms will not be booked through the local host. Instead, all participants in the 10th Working Meeting will have to book

their rooms direct. The address of Holiday Inn West, together with its telephone and numbers, will be published in the CSG NEWSLETTER and sent to all CSG correspondents to facilitate bookings.

Dennis David, Allen (Woody) Woodward, Paul Moler, Michael Jennings, John Thorbjarnarson, Tracy Howell, and Wayne King are acting as an ad hoc committee for meeting arrangements.

The meeting will be hosted by the Florida Museum of Natural History. Florida Game and Fresh Water Game Commission has been asked to act as co-host, and similar requests will go forth to the American Alligator Farmers Association, the Florida Alligator Farmers Association, the St. Augustine Alligator Farm, and other organizations and businesses involved with alligator management and utilization.

Fieldtrips are being organized by the local hosts. During the meeting, night-time airboat surveys will be run on Orange Lake which will enable participants to see how alligators are surveyed in prime Florida habitat. In addition, several post-meeting fieldtrips are planned to alligator farms in north Florida, and to farms in central and south Florida and the Everglades National Park.

The issue of the CSG NEWSLETTER, which will go to press as soon as the deputy chairman returns home following the CITES conference, will contain:

- a pre-registration form for the 10th Working Meeting
- accommodation booking information
- a preliminary agenda
- a call for papers, and information proper format for publication of the papers
- information on fieldtrips

In addition to the regular papers given by participants, the agenda will include workshop presentations by Dennis David on A MODEL MANAGEMENT PROGRAM FOR MANAGING WILD CROCODILE POPULATIONS, and by John Thorbjarnarson on the ACTION PLAN FOR CROCODILE CONSERVATION.

The chairman opened the discussion on the 10th Working Meeting by indicating a desire for two additional workshops: one on CROCODILE FARMING chaired by Jon Hutton, and one on TRADE IN CROCODILIAN HIDES chaired by Ginette Hemley and Richard Luxmoore.

That suggestion, for a total of four workshops, was unanimously agreed by the committee members. In addition, the chairman indicated that there will be several invited presentations on scientific topics.

The chairman also stated that papers given in the regular sessions will be limited to 15 minutes length, with an additional 5 minutes for discussion. He was emphatic in his determination to hold speakers to that time limit rather than allow some to run over and delay the entire program.

Wayne King reminded the chairman that he was one of the worst offenders when it came to running overtime.

The chairman acknowledged that in the past he had indeed been guilty of running beyond his allotted time, but pledged that he would hold himself to the same time limit he set for everyone else.

The chairman also believes that past meetings with continuous sessions were too intensive. People who have come halfway round the world want time to talk to colleagues they have not seen for two years. It was then agreed that one afternoon of the meeting should be free to allow people more time for informal discussions.

Fundraising. As promised at the first Steering Committee meeting, the deputy chairman gave the committee members a detailed accounting of all funds that had been contributed in support of the CSG program in the last 24 months. He explained how all contributions are handled. Payment is made out to the Crocodile Specialist Group and sent to the Deputy Chairman in Gainesville, Florida, U.S.A. These contributions are acknowledged and then deposited in the University of Florida Foundation, a public not-for-profit foundation operating under the 501(c)3 code of the U.S. Internal Revenue Service. Any funds that are accepted in support of a particular program can only be used for that purpose. The foundation accounts are audited both by the State of Florida and by the U.S. federal government. The deputy chairman also showed the committee members copies of the complete record of receipts that must be submitted to the foundation to document the proper disbursement of all funds.

The deputy chairman asked if there were any questions concerning any of the funds received or the disbursements charged against them. Several members commended the deputy chairman for

the completeness of the records.

The deputy chairman then called the attention of the committee members to account entries showing that during the last two years, the chairman and the deputy chairman personally had made considerable monetary contributions to the CSG program.

The chairman then instructed the deputy chairman to start a new accounting for funds that have been received since the chairmanship had changed.

Next, the chairman explained the fundraising responsibilities of each committee member. He indicated that, unlike his predecessor, he had no intention of raising \$10,000 for each member of the Steering Committee so they could run their offices and attend committee meetings. Instead, each CSG officer must meet operating costs by either getting support from his or her employing institution or by raising the necessary funds from outside sources.

The chairman then indicated that the CSG had recently received contributions from:

- Mainland Holdings Ltd., Lae Papua New Guinea.
- Harry Freeman, Hartleys Creek Crocodile Farm, Queensland, Australia.
- Horiuchi Trading, Tokyo, Japan.
- World Wildlife Fund, Washington, D.C., U.S.A.

Each contribution had been acknowledged first by the chairman and then by the deputy chairman when the check arrived in Gainesville, Florida. Finally, when the money was deposited in the University of Florida Foundation, it was acknowledged by the foundation staff.

The chairman then asked each committee member if he or she had raised any money for the CSG since the last meeting. Apart from the Deputy Chairman, as recorded in the accounting he had presented to the committee, and Ginette Hemley, who helped raise the contribution from WWF, none of the members present had. The chairman pointed out that he had raised the contributions from the first three on the list above. He then urged the members to get busy and raise funds for the CSG and for their own mail, telephone, fax, secretarial support, and travel.

Publications. The deputy chairman reviewed the status of the CSG publications:

- **CSG NEWSLETTER** - The deputy chairman will continue to compile and edit the newsletter. The time spent editing and producing the camera ready copy for the printer is contributed by the deputy chairman. The cost of printing the next three issues of the newsletter has been paid for by Mainland Holdings Ltd. and Harry Freeman. The cost of mailing the newsletter is borne by the Florida Museum of Natural History, but if the CSG continues to grow it may be necessary to pick up these costs in the coming years. To produce the newsletter, a file is created on the computer into which news is entered as correspondence is received. At the end of three months, the newsletter is essentially complete and the file only has to be formatted and printed on a laser printer. This eliminates the frenzy of last minute typing that is required to compile the usual newsletter from a three month accumulation of letters and articles.

- **PROCEEDINGS OF THE 9TH WORKING MEETING** - The deputy chairman asked if any committee member wished to edit the papers from the Lae meeting and arrange for their publication. He then stated that he did not intend to edit the proceedings personally, but would supervise the task if funds were allocated for hiring a University of Florida graduate assistant. Funds are available in the UF Foundation, but the deputy chairman would not authorize their expenditure for this purpose without approval of the committee. After some discussion, the committee approved the commitment of \$7,000 for a one-third time graduate assistantship to run from now through May 1990.

[Subsequent to the committee meeting, the chairman decided that henceforth all papers in the PROCEEDINGS would be published just the way they are handed in by the authors. The PROCEEDINGS is a record of the papers given at the Working Meeting and as such requires no editing. If the author turns in an error-filled manuscript, that is the way it will be published. Save for numbering the pages consecutively and adding a table of contents, the volume will be unedited. With editing eliminated, the approval for hiring an assistant to edit the PROCEEDINGS of the Lae meeting was withdrawn.]

- **SPANISH LANGUAGE PUBLICATION ON CROCODILIAN FARMING** - This publication should be finished before the end of 1989, and sent to the printer shortly thereafter. The cost of production was underwritten by Jacques Lewkowicz and Société Nouvelle France Croco.

- **ACTION PLAN FOR CROCODILE CONSERVATION** - Following the workshop presentation at the Gainesville meeting in April 1990, the Action Plan will be finished and published.

Stephen Edwards announced that there were funds in the SSC 1990 budget for the cost of publishing the ACTION PLAN FOR CROCODILIAN CONSERVATION. The deputy chairman agreed that the plan would be finished by mid-1990, in plenty of time to take advantage of the offer.

Kevin van Jaarsveldt indicated that he would attempt to raise the funds for publication of the PROCEEDINGS of 10th Working Meeting in Gainesville.

Other Business. Romulus Whitaker indicated that India's excellent crocodile conservation program had encountered an unexpected snag in the form of bureaucratic reluctance to allow farms to sell hides (see A SURPLUS OF MUGGER CROCODILES on p. 18 below). India's program originally had been conceived as one which first would conserve the wild crocodiles and then at some later date would provide income through regulated utilization. That was the basis upon which India received assistance from FAO experts in initiating the program. The hatcheries and head-starting programs had produced many crocodiles and gharial for stocking sanctuaries and areas of suitable habitat. The gharial and saltwater crocodile populations were still recovering, but so many muggers have been released that no more releases are planned. All available mugger habitat has been restocked, local people are beginning to complain about the numbers of muggers they encounter, and the farms have all the muggers they can hold. The government of India has agreed to supply mugger crocodiles to Pakistan for restocking habitat in that nation, but that will not long relieve the space problems facing the farms. The government of India refuses to grant the farms permission to harvest hides from their surplus

muggers for fear that any trade in crocodile hides, no matter how rigorously controlled, will stimulate poaching and illegal trade. Unless the government can be convinced to allow a controlled commercial utilization, the farms have no choice but to put an end to captive breeding programs.

The date and venue of the next Steering Committee meeting was set for Saturday, 21 April 1990, in Gainesville, Florida, U.S.A.

There being no further business, the meeting was adjourned by the chairman.

7th CITES CONFERENCE

CITES MEETING SUMMARY: CROC TRADE CONTROLS FURTHER LOOSENED. The 7th Meeting of the Conference of the Parties to CITES took place 9-20 October in Lausanne, Switzerland. The largest CITES gathering ever held, the meeting was attended by delegates from 91 of the 104 CITES member nations and observers from over 130 non-governmental organizations, including several members of the Crocodile Specialist Group. While the meeting was dominated by discussions over the African elephant, which was transferred from CITES Appendix II to Appendix I, proposals affecting the status of the Nile crocodile, the slender-snouted crocodile, and the saltwater crocodile also took up a significant share of the conference debate. Other technical issues relating to croc trade and conservation, such as CITES ranching criteria and export quota systems, were also reviewed.

The CSG played a major role in the CITES decisions affecting crocodilians. The CSG Steering Committee developed negotiating positions on the proposals at its meeting just prior to the start of the conference [see Crocodile proposals, page 4 above], and Deputy Chairman Wayne King coordinated CSG input during the conference debates. In addition, numerous informal discussions were held between CSG members and delegates from African countries and Indonesia which led to important exchanges of information. In his capacity as consultant to the CITES Secretariat, Jon Hutton guided the Nile croc discussions and provided valuable input on the status of Nile croc conservation programs throughout Africa.

Ten African countries submitted proposals to downgrade the status of their Nile crocodile populations, seeking CITES approval for either ranching programs or export quotas. The CITES ranching criteria allow a crocodile population to be transferred from Appendix I to Appendix II if data are presented to show a healthy population status and a well-established ranching and trade control system, while the so-called 'special criteria' adopted in 1985 allow a population to be temporarily transferred to Appendix II under an export quota system while population data are collected and/or a ranching program is being established. Proposals pertaining to the latter proved to be the more controversial because many lacked any form of substantive population data and several involved countries that lack the ability to properly control trade.

The CITES Parties agreed to transfer the Nile crocodile populations of Botswana, Malawi, Mozambique, and Zambia to Appendix II under the ranching criteria. Ranching programs for Malawi and Zambia in particular were well-articulated, and in spite of political unrest in Mozambique, the country's burgeoning ranching program was seen by the Parties as promising. Of the four countries, Botswana came under the most scrutiny for two reasons: the country continues to maintain a reservation on the Appendix I listing of the Nile croc, and its conservation program seems to be based more on plans for captive breeding of the Nile crocodile than on ranching. In addition, questions arose regarding recent Botswana exports of wild-caught live crocodiles to South Africa and Namibia, apparently to stock croc farms in those countries. Botswana agreed to withdraw its reservation on the Nile croc, citing the lack of its withdrawal as a technical oversight, and also to clarify the status and activities of the two CITES-registered captive-breeding farms. With these promises, the CITES Parties accepted Botswana's proposal.

The submission of proposals for four new ranching programs in Africa signaled to conference attendees that important progress is being made in the development of Nile crocodile management programs. It also made clear that certain aspects of the CITES ranching criteria need clarifying, particularly regarding the issue of continued hunting of wild adult animals once a ranching program is established. While the CITES criteria intend to discourage such hunting after a ranching program based on egg or

hatchling collection is in place, they do not specifically prohibit it. Malawi, Mozambique, and Zambia made clear that they intend to continue allowing a limited amount of cropping, including for nuisance animals. Many conference attendees agreed that, once a ranching program is established, cropping should not be a principal activity of a management program, and that the CITES ranching criteria should probably be modified to require that any plans to hunt wild adult animals be specifically outlined in all future proposals submitted for consideration by the Conference of the Parties.

Nile crocodile export quotas were adopted for six other countries: Ethiopia, Kenya, Madagascar, Somalia, Sudan, and Tanzania (see Table). Controversy surrounded several of these proposals. For example, Kenya came under criticism because it did not provide any population data to back up its proposed export quotas, and data presented at the conference suggest that one of the country's two CITES-

registered croc farms has apparently suffered from mismanagement and has also been exporting wild skins as well as shipping wild crocodiles to stock a farm in Israel. Kenya agreed to fully review the farming operation and if necessary withdraw the CITES registration. The data presented in the Somalia proposal seemed to greatly overestimate the size of that country's crocodile population, and Somalia agreed to lower its quota request from 2,000 to 500 skins per year. Tanzania, which had been granted an annual export quota of 1,000 skins for 1985-86 and 2,000 skins for 1987-88, has not yet carried out a population survey but is developing plans for a ranching program, and its quota request for the next three years was accepted. Finally, much concern surrounded Madagascar's proposal, which was submitted as a ranching proposal but after lengthy discussions was adopted as an annual quota proposal. According to Jon Hutton and Olivier Behra, Madagascar is the only country that has been granted a CITES

Crocodilian Quotas Adopted by the 7th CITES Conference

	1990	1991	1992
Nile crocodile (<i>Crocodylus niloticus</i>) *			
Ethiopia	6,870	8,870	
Kenya	5,000	6,000	8,000
Madagascar	0	2,000 R	4,000 R
Somalia	500	500	500
Sudan	5,040 S	-	-
Tanzania	3,500	3,500	-
Slender-snouted crocodile (<i>Crocodylus cataphractus</i>)			
Congo	600	600	600
Saltwater crocodile (<i>Crocodylus porosus</i>)			
Indonesia	3,000	3,000	2,500
	2,000 R	3,000 R	5,000 R

* Botswana, Malawi, Mozambique, and Zambia now have ranching proposals like Zimbabwe and no CITES imposed limitations on exports.

R Applies to ranched skins.

S Applies to stockpiled skins.

From: Hemley, G. 1989. CITES 89: African Elephant and More. TRAFFIC (USA) 9(4).

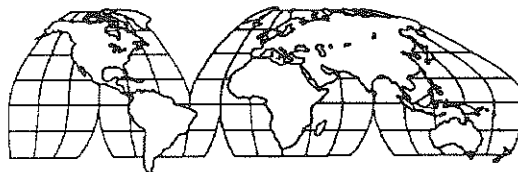
export quota whose crocodile population had suffered greatly as a result of uncontrolled hunting and trade. The available data indicate that Madagascar's crocodiles are greatly depleted. At the same time, FAO is developing a ranching program there that could have important conservation benefits. Madagascar agreed to accept a 'zero' quota for 1990 while the ranching program is being set up, and the CITES Parties agreed to give Madagascar an export quota for ranched specimens only for the two following years.

The final African proposal approved by the Parties came from the Congo, which was granted an annual export quota of 600 skins for *C. cataphractus*. The Congo is the only country now allowed to export this species. The Congo also did not renew its quota for *Osteolaemus* when it found that there was no market for the skins.

Perhaps the most controversial of all crocodilian proposals at the conference was Indonesia's request to increase its annual export quota for *C. porosus*. Many conference attendees objected to allowing any quota for Indonesia because of continuing and apparently widespread illegal trade. After lengthy discussions between CSG representatives and the Indonesian delegation, of which CSG member Jack Cox was part, Indonesia publicly promised to ban all crocodile (as well as parrot) trade with Singapore, the region's most important illegal skin laundering center, and to revoke the licenses of all foreign nationals involved in illegal wildlife trade in Indonesia. Given this promise and the fact that the Indonesian wildlife department is under new leadership, the CITES Parties accepted a modified proposal for Indonesia outlining separate export quotas for ranched and wild specimens.

The 8th Conference of the Parties to CITES is scheduled to take place in April in Japan. It is hoped that those African countries that were granted export quotas this year will make significant headway in developing ranching programs by 1992; this will no doubt require both technical and financial assistance over the next two and a half years. In addition, Indonesia's crocodile program will have to be carefully monitored for illegal trade and to determine which combination of management techniques is not suited to conserving the saltwater crocodile in that country. -- Ginette Hemley, *TRAFFIC (USA)*, 1250 24th Street NW, Washington, D.C., 20037, U.S.A.

AREA REPORTS



AFRICA

Botswana:

John and Ursula Seaman, Okavango Swamps Crocodile Farm, Pvt. Bag 47, Maun, N'gamiland, Botswana, write,

We have installed a special electronic incubator with temperature probes in the boxes, including humidity probes in and out of the boxes. The results for the 1988/89 season; 3 boxes 100% hatching and the balance 96% success. We also have established a growing area with circular dams, which are flushed with preheated water on arranged flushing periods and times. We actually replace with new water 6 times in 24 hours. The effluent is channeled into a dam which is stocked with catfish. The inflow water has in-line filters for medication or chlorination. The dams are covered with thermo covers.

Congo:

Marcellin Agnagna, Director of Fauna Conservation, B.P. 2753, Brazzaville, reports that dwarf crocodiles, *Osteolaemus tetraspis*, nested this year in the Congo in March and April. He examined a total of 20 nests, seven of which contained clutches of 11 eggs and thirteen of which had clutches of 12. The nests were built of dead leaves stacked on tree roots. Hatching occurred from the last half of May to the end of July. Apparently, nesting occurred earlier in the northern Congo for 4 hatchlings were captured leaving a nest in the Likowala forest in March.

Marcellin visited Zimbabwe last year as part of his department's effort to develop a professional program in the Congo. He hopes to gain more experience by attending the 10th Working Meeting in Gainesville in April and then visit alligator farms throughout the southeastern United States. [Marcellin's names

inadvertently were inverted on page 3 of the July-September 1989 NEWSLETTER - Ed.]

South Africa:

THE NILE CROCODILE FARMERS ASSOCIATION. The Nile Crocodile Farmers Association was founded on 12 May 1989 at River Bend Crocodile Farm, Ramsgate, Natal, South Africa. Six of the 25-odd South African farms were represented and all of them were Natal farms.

The following persons were present at the meeting: Howard and Trevor Kelly, River Bend Crocodile Farm; Peter Watson, Crocodile Creek; Graham Stewart, Stewart's Farm; Arthur Wilmans and Johan Marais, Assagay Safari Park; Norman Bristow, Shongweni Crocodile Farm; Angus Drummond, Crocworld; and Drummond Densham and Dave Blake, Natal Parks Board.

Strath Brown of Victoria Falls Crocodile Farm happened to be on holiday in the vicinity and attended most of the proceedings.

Minutes of a previous meeting, held by Natal farmers, was read by Howard Kelly. It was of interest to note that the Natal Parks Board had harvested seven *Crocodylus niloticus* nests from the wild and the hatchlings were subsequently sold to commercial farmers.

Drummond Densham of the Natal Parks Board then addressed the meeting on how he saw the future of the crocodile farming industry in South Africa. He elaborated on a vision of 500,000 skins being produced annually in South Africa in years to come. This suggests that the authorities in Natal have little idea of what is happening in commercial crocodile farming in South Africa and in the world.

This was followed by a rather interesting talk by Strath Brown on commercial crocodile farming in Zimbabwe and on their farmers association.

Dave Blake then spoke on the policy of the Natal Parks Board with regards to crocodile farming: application procedure and permit conditions; financial arrangements when purchasing crocodiles from N.P.B., and a crocodile drugging course to be held in the near future. It is hard to imagine what he is going to teach people about drugging crocodiles over a two day period but I do look forward to the event.

I reported back on the American Alligator Farmers Association congress in Tampa, Florida, U.S.A.

Finally, it was decided to establish 'The Nile Crocodile Farmers Association' and the following persons were elected: Howard Kelly as chairman, Arthur Wilmans as secretary, and Angus Drummond as treasurer. It is their intention to:

- arrange a national meeting during which members of an executive committee and members of regional committees will be elected. This meeting will take place within the next three months.
- present a proposed constitution during the said meeting, and
- outline the aims and objectives of the association.

The South African Crocodile Farmers Association, which was founded in 1982, collapsed several years ago for a variety of reasons. The main reason, however, was the fact that there was interference with free enterprise. At present, the Transvaal Crocodile Farmers Association still exists. They meet once a year, usually without an agenda and nobody taking minutes. Several of its members have expressed dissatisfaction with the organization.

Despite what many farmers believe, they desperately need an official spokesman and the proposed association could provide it. The new association will have to show farmers how it is going to benefit them as most of the farmers are very wary and suspicious. I believe that there isn't a single farm that has done a lot to promote the industry in general (I am not referring to what farmers do to promote their own enterprises) and this will have to be one of their major objectives. The Sun City workshop held in 1986 is the only major workshop ever held in this country. -- Johan Marais, Assagay Safari Park, P.O. Box 414, Botha's Hill, 3660 Natal, South Africa.

NILE CROCODILE: THE SURVIVAL OF MAN, CROCS, AND FARMS. As a crocodile consultant, I have been involved in several interesting and varied projects this year. One of these was in supplying the relevant information and in compiling a manual, **THE NILE CROCODILE - HOW TO SURVIVE**. The completed manual, 63 pgs., 47 color slides and a cassette of 16 crocodile vocalizations, describes the anatomy, physiology, behavior and ecology of the crocodile and is aimed basically at how best to avoid crocodile

attacks and what to do if attacked by a crocodile. Courses for instructors were organized as well at a local crocodile farm, where they could obtain experience of the animal *in situ* after the series of lectures. The document was commissioned and is not available for distribution.

Tests at developing a method of deterring crocodile attack, namely a hand held shocking mechanism, were carried out, with very promising results. Initial trials were conducted on known sized crocodiles at the St. Lucia Crocodile Center to obtain basic data. The second phase involved field trials in the Kruger National park, where divers operated from cages in the Crocodile River and were able to test the effectiveness of the apparatus on free-ranging crocodile of 2.2 m to 4.2 m in size, lured to the cages baited with meat, or attracted by the playing of hatchling and juvenile distress signals. Underwater and video cameras were employed and shore observers were in contact with the divers by underwater telephone to give them advance warning of approaching crocodiles as underwater visibility was limited. Further trials are to be conducted soon. The equipment used was designed by Dr. Anacreon Cloete of the University of Pretoria.

The Natal Museum in Pietermaritzburg opened a new Dinosaur Hall on May 18th 1989. I supplied a series of color slides on the life of the Nile Crocodile specifically aimed at school children. Whilst no-one of course can say what sounds the large dinosaurs were capable of producing, a tape of crocodilian roars, bellows, grunts, and other vocalizations has been used as background in the Dinosaur Hall and is quite effective.

Another interesting investigation has been into mortality of crocodiles caused by blasting. Briefly, the owner of Crocodile Creek, a tourist and commercial crocodile farm at Tongaat, north of Durban, suffered unusually high mortality coinciding with the commencement of blasting during construction of a new highway that will pass within 50 m of his farm. The blasts, to remove huge quantities of rock, occurred within 100 to 150 m from where his animals are housed in both open ponds and in controlled environment units. The charges of up to 2800 kg of dynamite were like mini-earthquakes, sufficient to cause cracks in the walls of buildings and ponds. The animals suffered acute distress, some dying within 24 hours, others taking up to 3 weeks and because of continued and irregular

blasting, feeding ceased and coupled with the stress, plus cold weather conditions, animals lost condition rapidly. My recommendation to the National Transportation Commission was to discontinue blasting until the remaining 550 crocodiles could be moved from the site. This was agreed to and by 16 September 1989 all of the animals will have been relocated. The decision did not increase my popularity with the contractors as they lose thousands of dollars a day until blasting could be resumed. I will now be involved in the field of legal wrangling over claims for compensation to loss of stock, revenue through tourism and so on. A new field in crocodile conservation for me! I would appreciate hearing from any colleagues who may have had experience of the effects of blasting, or of excessive noise such as from jet aircraft, causing stress to crocodilians. Or who may have come across literature relevant to this topic.

Interest in commercial crocodile farming has accelerated in recent months and I have been involved in technical design and feasibility projects in Portugal, Spain, and with two in South Africa.

A landmark in commercial farming in South Africa was the formation of The Nile Crocodile Farmers Association at a meeting held at Crocworld, Natal, on 12 August 1989. [This was the national meeting referred to in 'The Nile Crocodile Farmers Association' above -- *Ed.*] Thirteen farmers, just over half of the total number in South Africa, got together and drew up a legal constitution. The original S.A. Crocodile Farmers Association was formed on 26 March 1983 but after about a year disbanded and until recently there were two groups, the Transvaal Breeders Association and the Natal Crocodile Farmers. Hopefully all will join the newly formed association. -- Tony Pooley, *Pooley Wildlife Productions, P.O. Box 295, Scottburgh, 4180 Natal, South Africa.*

THE CROCODILIAN STUDY GROUP OF SOUTHERN AFRICA. The Crocodilian Study Group of Southern Africa has been established as a bureau to present firsthand information on crocodilians, crocodile research and crocodile production to its members.

The objectives of the study group are to:

- create a forum through which participants can be kept informed of the latest research findings and developments pertaining to all

aspects regarding crocodilians in the world and South Africa in particular.

- create a forum for producers and researchers to exchange ideas and identify information gaps which could either be followed up by liaising with producers abroad, literature studies or research projects, to the benefit of the industry.

Information will be disseminated to all participants by means of a newsletter which will be compiled on a regular basis when relevant and appropriate information comes to the attention of the coordinators.

Regular updates on the most recent literature and developments in the world of crocodilians which may be of interest to the crocodile producer and/or research enthusiast, will be possible due to the close liaison this study group has with the Crocodile Specialist Group of the Species Survival Commission, the American Alligator Farmers Association, and other bodies involved with crocodilians. Apart from this, we have access to the CROCLIT database.

The Crocodilian Study Group of Southern Africa is not a society or association for producers or scientists, nor is it associated with such a society or association. It is a group of crocodilian enthusiasts interested in collaborating to their mutual benefit.

The coordinators of the study group are:

Mr. Johan Marais	Prof. G.A. Smith
P.O. Box 414	Dept. Animal Science
Botha's Hill	University of Pretoria
3660 Natal	Pretoria 0001
South Africa	South Africa

Participation in the study group will be open to all progressive producers and crocodilian enthusiasts. Should you be interested in joining the group, please contact one of the coordinators at the above addresses. -- Johan Marais, P.O. Box 414, Botha's Hill, 3660 Natal, South Africa.

ASIA

China:

There are 25 newly hatched Chinese alligators and 6 adults in the Shanghai Zoo. In Changxing Crocodile Farm of Zhejiang Province the number of young and old alligators is 72.

In Anhui Research Centre of Chinese

Alligator Reproduction, more female alligators are laying eggs, and eggs have been obtained from the second generation. Tests are being conducted on new methods to make the alligators grow faster and on utilization of alligators. Since more than a thousand baby alligators are hatched each year, the centre has decided to have birth control. -- Prof. Huang Chu-Chien, *Institute of Zoology, Academia Sinica, 7 Zhongguancun Lu, Haidian, Beijing, People's Republic of China 100080.*

Professor Chen Bihui, Dept. Biology, Anhui Normal University, Wuhu, Anhui Province, reports the following news:

1. Temperature-dependent sex determination in Chinese alligators has been researched. Forty eggs were incubated at 33°C-35°C and produced 36 hatchlings of which 91% are males, 6% females, and 3% bisexuals. The lower temperature experiment is being carried on.

2. Influence of mucous material around the Chinese alligator's eggshell on egg incubation has been examined. It is possessed of function that prevented the egg from dehydrating and too much environmental water from flowing in.

3. Hainan Province is contemplating establishing a new crocodilian farm for tourism and trade. They will give the investor a hearty welcome.

India:

CROCODILE CONSERVATION PROGRAMME IN ORISSA: AN OVERVIEW. Since 1975, Orissa State has been a pioneer in implementing a crocodile conservation program for all three Indian crocodilian species; gharial, *Gavialis gangeticus*, saltwater crocodile, *Crocodylus porosus*, and mugger crocodile, *Crocodylus palustris*. To save these giant reptiles from near extinction, and to multiply their number as quickly as possible, the State Forest Department, with assistance from the Government of India and FAO/UNDP established the Gharial Research and Conservation Project at Tikarapara in Satkosia Gorge Sanctuary; the Saltwater Crocodile Project in Bhitarkanika Wildlife Sanctuary, the Mugger Crocodile Project at Joshipur in Similipal National Park,

and a breeding project for captive breeding of the three species in Nandankanan Biological Park.

These projects have made tremendous progress in 'rearing and rehabilitating' a large number of crocodiles into most depleted crocodile habitats in the sanctuaries and national parks of the State, which was the main objective of the Crocodile Conservation Programme of the state and country.

The progress achieved during the last twelve years by the fruitful conservation and research activities are as follows:

Gharial. The Gharial Research and Conservation Project was established in April 1975 at Tikarapara in Dhenkanal District. This was the first conservation project of its kind in the world. Due to indiscriminate killing of these animals and habitat loss, the population of gharial had been reduced to only five animals in the protected areas of the gorge. The immediate need was to collect wild eggs, incubate and hatch them, and rear the young for 2 to 3 years at Tikarapara before releasing them at 1 to 2 m length to restock suitable habitat.

In the beginning it was not possible to get the eggs from the Satkosia gorge or Mahanadi river which lacked breeding populations, so eggs were collected from the Gandak river in Bihar in 1975 and subsequently in the Chambal river in Uttar Pradesh and the Narayani river in Nepal.

To date, 550 captive reared gharial have been released into the Satkosia gorge and a few more releases are planned there. The field staff monitors the movements and survival of the released gharials.

A female gharial has been laying fertile eggs in the gorge since 1984, a significant accomplishment of the decade long conservation effort. The gharial program need no longer depend on collection of eggs in other states.

The research and husbandry staff has collected various data on gharial biology in captivity and in the wild. In addition, an annual census of the population in the river Mahanadi has been conducted during the winters of 1987 and 1988 to monitor the status of the gharials released there. Only 25 gharials were seen which gives a sighting success or observed survival rate of 4.5% in the river. Attempts are being made to breed the gharials at Tikarapara by simulating natural conditions.

Saltwater crocodile. The Saltwater Crocodile Research and Conservation Project was

established in July 1975 at Dangmal in the middle of Bhitkar Kanika Wildlife Sanctuary, which was later upgraded to a national park.

The saltwater crocodile population suffered a dramatic decline during the post-World War II period due to the large scale hunting for their skin and to habitat loss. Bhitkar Kanika is the only mangrove forest habitat in India that still has saltwater crocodiles. The 1974 survey by Dr. H.R. Bustard revealed that no more than 25 crocodiles remained in the forest. This included a male estimated to be 23 to 24 feet in length, possibly the largest crocodile in the wild today.

The rear and release program for the saltwater crocodile has been quite successful. Since its inception, wild eggs have been collected from different forest blocks in the sanctuary. To date, more than 3,000 eggs have been incubated, and 1,050 young saltwater crocodiles have been released into the creeks and river systems of the sanctuary. A few more releases are planned for the future. In addition, 24 three to four year old crocodiles have been supplied to crocodile conservation projects in other states. Data have been collected regularly on nests and nesting, incubation of eggs, rearing of hatchlings, food and feeding, captive breeding, and annual census of the wild population. The January 1988 census counted a total of 433 saltwater crocodiles in the river systems in Bhitkar Kanika Sanctuary, indicating about a 40% survival in nature.

At present, there are 356 crocodiles of various age groups, including a white crocodile, being reared in the pools at Dangmal. This white crocodile, with the local name 'Sankhua', laid 17 eggs in 1985 and 42 eggs in 1988. Unfortunately, for lack of a suitable male, the eggs have been infertile.

Mugger crocodile. The Mugger Crocodile Project at Ramtirtha, Joshipur, in Similipal National Park was established with only 24 mugger crocodiles brought from Tamil Nadu in 1979. These crocodiles had been breeding more or less continuously since 1980, and their hatchlings are being reared in pools at the project.

To date, more than 159 young mugger crocodiles have been released into the West Deo and Budhablang rivers within Similipal National Park. Their activities are being monitored by park staff. A few more will be released early next year. Data on the breeding biology of mugger crocodiles have been collected by the project staff.

Captive breeding. Since 1980, the captive breeding project at Nandankanan Biological Park, has made tremendous progress, particularly in breeding gharials.

A male gharial resident at the park apparently was unable to breed, but in January 1980, a large adult male obtained from the Frankfurt Zoo, Federal Republic of Germany, was introduced into the specially designed breeding enclosure and it was observed to mate that season. A clutch of 25 fertile eggs was laid in March 1980. In subsequent years, the breeding success has continued to grow. At present, the breeding pool houses one adult male and six adult females. Five out of the six female gharials in the breeding pool have laid eggs regularly. The hatching success is satisfactory and 224 hatchlings are being reared with much care.

During the past winter, 194 young gharials of 2 to 3 years of age were released into the Satkosia gorge of the river Mahanadi and more will be released in the future.

In 1985, six young gharials were supplied to projects outside the state, 2 to Tripura Zoo and 4 to Madras Zoo.

Captive breeding of mugger crocodiles also is successful at Nandankanan. At present 38 mugger, including 5 adults are housed in various pools.

Breeding saltwater crocodiles started in 1983 when a male was obtained from Kukrail, Uttar Pradesh, and released into a breeding pool with a lone female that had been laying infertile eggs. The next year, she started laying fertile eggs and has continued to do so. -- Sudhakar Kar, Research Officer, c/o Chief Wildlife Warden, 315 Kharavelanagar, Bhubaneswar 751 001, Orissa, India.

A SURPLUS OF MUGGER CROCODILES. To find a new home for the large number of mugger crocodiles (*Crocodylus palustris*) now being reared at 34 crocodile rearing centres in the country, the Government of India has asked various State Chief Wildlife Wardens to explore possibilities of releasing some of these crocodilians in over 500 different areas wherever ideal mugger habitats exist.

The Wildlife Institute of India (WII) is examining impounded waterbodies formed by large and small dams in rivers as possible reintroduction sites. Those reservoirs which are

encompassed by protected areas with a recent history of the occurrence of crocodilians will be made the first choice for restocking with mugger crocodiles.

While this is being done, to minimize conflict between commercial fisheries and crocodiles, it is also being determined if some areas within reservoirs could be delineated for exclusive fishing rights and some closed to fishing.

The Govt. of India has asked the WII and various state governments to study the possibility of fishermen taking up mugger crocodile farming as an alternative source of livelihood for those who are displaced from riverside habitat because of protected area management needs or because of river valley projects.

With gharial now breeding in captivity at five locations and with reintroduced gharial and saltwater crocodiles commencing to breed in the wild, the Indian crocodilians appear to be safe.

The next five years are going to see a change in the management concept of crocodilians in India. -- B.C. Choudhury, Scientist-SD, Wildlife Institute of India, P.O. New Forest, Dehra Dun-248 006, UP, India.

Indonesia:

AERIAL SURVEY AND EGG HARVEST OF *CROCODYLUS NOVAEGUINEAE* IN THE MAMBERAMO-ROUFFAER RIVER SYSTEM OF IRIAN JAYA. The annual nesting survey of the New Guinea freshwater crocodile, *Crocodylus novaeguineae*, in the vast Mamberamo-Rouffaer river system was conducted from 6-10 November 1989. This third consecutive year of aerial nest counts from a wide variety of sample sites yielded results which indicate crocodile populations in Irian Jaya's most important stronghold of the species are stable, if not increasing. Nest counts in 1988 were identical to baseline counts of 1987, but the 1989 results showed an overall increase of 21 percent. Another pleasant surprise was that none of the 141 nests spotted on the surveys were raided by humans. Although indiscriminate hunting remains a problem in the area, large well-organized poaching operations appear to have ceased. Most important, local residents are increasingly supporting the conservation-oriented advantages of hunting within the established 25-46 cm belly width limits.

In conjunction with the survey, FAO-PHPA project personnel also carried out a trial egg harvest, patterned after those in Papua New

Guinea. Clutches were selected from high density nesting sites, and from nests likely to fail due to floating mat subsidence. A total of 678 eggs, comprising 20 clutches, were collected by helicopter. A single *C. porosus* clutch of 78 was found to be included. Of the 600 *C. novaeguineae* eggs, 475 (79.2%) appeared viable at the time of collection. Most of these were air-freighted to the government farm in Sorong for incubation. Hatchlings are being reared in controlled environment pens constructed by the project. Factors affecting hatchling survivorship and growth, such as feed, stock density and pen environment will be a major research topic at Sorong during 1990.

While notable progress has been made over the past three years with management of *C. novaeguineae* stocks in Irian Jaya, project activities during the 1990-1991 extension phase will emphasize stabilization of *C. porosus* populations in remaining strongholds of the Indonesian archipelago. Four areas in Irian Jaya already benefitting from surveys and extension will be intensified, especially the vital aspect of curtailing the illegal skin trade. Managing saltwater crocodiles in Indonesia is a much more difficult challenge than for 'freshies', owing largely to the more open and accessible character of their coastal and estuarine habitats. This renders the species much more vulnerable to overhunting, and often frustrates efforts to control the transport of skins. The situation is further aggravated by current skin prices (highest ever) and the emergence of an even higher priced market for large skins. Without newly found vigilance, these factors have the potential to undermine the cornerstone of wild populations management: protection of breeding cohorts.

Outside Irian Jaya, initial surveys of *C. porosus* and *Tomistoma schlegelii* in Kalimantan and Sumatera will be conducted as part of the project's Action Plans for endangered crocodilians. *C. porosus* surveys and

management activities will also be expanded to the Maluku Islands and Central Sulawesi during 1990. -- Jack H. Cox, Chief Technical Advisor, FAO-PHPA Project GCP/INS/OGO/JPN 'Crocodile Industry Development', P.O. Box 969, Jayapura 99001, Irian Jaya, Indonesia

Japan:

Yoshio Kaneko, CITES Secretariat, Lausanne, Switzerland, announced that the government of Japan removed its reservation on *Crocodylus porosus* effective 30 November 1989. This leaves Singapore as the only remaining international buyer of illegal (i.e., non-CITES sanctioned) *C. porosus* hides. The Japanese government is to be congratulated, and special thanks must be extended to all the Japanese reptile hide traders whose cooperation made this possible.

Malaysia:

Robert B. Stuebing, Jabatan Biologi, Universiti Kebangsaan Malaysia, Kampus Sabah, Locked Bag No. 62, 88996 Kota Kinabalu, Sabah, reveals,

We are currently studying the population ecology of *C. porosus* in a west coast (Sabah) river.

Spotlight counts of *C. porosus* were done in 1987-88 in the Klias River and are being written up. A mark-recapture program began in April 1989 and will continue until March 1990.

A large and successful breeding farm for *C. porosus* still exists near Kuching, Sarawak, run by a Mr. Johnson Jong. In Sandakan, Sabah, a smaller facility exists (owned by a Mr. Chai), though breeding is done only on a small scale. Though illegal hunting in Sabah (for *C. porosus*) is common, the crocodiles still appear to be surviving relatively well.

Nepal:

The following is reprinted from the September 1989 issue of WILDLIFE NEPAL:

Gharial (*Gavialis gangeticus*) a freshwater and fish eating crocodile, has recently been seen for the first time after re-introduction in the Koshi River in East Nepal. A group of three individuals was



seen on the bank of the Trijuga, a tributary of Koshi and one in the main channel of Koshi, but none were seen before this. The observer says that the gharial seen on the Koshi bank was a hatchling but the source is yet to be confirmed. Gharial is one of the endangered and fully protected reptiles of Nepal. At different occasions two batch of 42 gharials in each group were released in Koshi River in 1983 and 1986 in view to re-stock the wild population. A Gharial Breeding Center has been established in Royal Chitwan National Park with the assistance of Frankfurt Zoological Society in 1978. More than 300 gharial babies from this center have been released in different major rivers of Nepal.

Philippines:

THE REPUBLIC OF THE PHILIPPINES-JAPAN CROCODILE FARMING INSTITUTE. The RP-Japan Crocodile Farming Institute (CFI) has at present acquired a total of 157 crocodiles. The majority came from two areas in the Philippines, namely 46 crocodiles from Palawan (where CFI is located), and 100 from Cotabato (Mindanao). The rest are from Agusan, Panay, and Mindoro.

From 1987 to the present there have been a total of 38 mortalities, mostly hatchlings, leaving us with 93 *C. porosus* and 26 *C. mindorensis*.

From April to 30 June 1988, a pair of *C. mindorensis* from Cotabato nested and laid 21 eggs in one of our breeding pens. Only one egg produced a totally formed embryo but it did not hatch; the rest were infertile.

Breeding is on a 1:1 ratio and out of a total of 25 breeders, we have 9 mated pairs (3 pairs of *C. porosus*, 6 pairs of *C. mindorensis*). The other breeders are still adjusting to captive conditions having been just caught from the wild. Early this month [May 1989], 4 pairs (3 pair of *C. mindorensis*, 1 pair of *C. porosus*) started nest building and we expect to produce more eggs, and hopefully hatchlings, this year.

While breeding and other studies are ongoing, another priority is the survey of habitats and acquisition of more crocodiles. Remaining populations in different parts of the country are trapped by local inhabitants with technical advice from CFI. The Protected Areas and Wildlife Bureau of the government has given the CFI a permit to collect a specified number of crocodiles

from designated areas. The CFI staff then transport them through Philippine Airlines via Manila to CFI Palawan.

The CFI has a Memorandum of Agreement with the Manila Zoological and Botanical Garden (MZBG) in the breeding of *C. porosus* and *C. mindorensis*. On 17 April 1988, the MZBG pair of *C. mindorensis* produced 19 eggs which were incubated artificially and formed 7 embryos but did not hatch. The *C. porosus* pair produced 17 eggs but all were infertile.

We are improving the nutrition of our breeders which hopefully will increase breeding success.

Prof. Angel C. Alcala, Silliman University, started working as a consultant to CFI in March 1989.

The CFI, MZBG, and Silliman University are the only 3 crocodile captive breeding programs in the Philippines, and so far only Silliman University under Prof. Alcala has successfully bred *C. mindorensis*. -- Dr. Jose L. Diaz, RP-Japan Crocodile Farming Institute, Irawan, Puerto Princessa City, Palawan, Philippines.

AUSTRALIA/OCEANIA

Australia:

CSG NEWS FROM AUSTRALIA. Using spotlight/helicopter conversion factors developed over the past few years, we can now annually survey by helicopter 70 tidal rivers and creeks across the Northern Territory which gives us a better overview of population trends in the Territory. The numbers of *Crocodylus porosus* are still increasing by 5-6% annually with no impact from the harvest of eggs evident.

In addition to the surveys in the Northern Territory, we have been surveying crocodiles in Western Australia along with nesting surveys and egg collections. Our findings have been used by the government for establishing a quota of eggs and animals, both *C. porosus* and *C. johnstoni*, to stock a new crocodile farm in Wyndham, W.A.

We have just completed another year of our ongoing study of *C. johnstoni* population in the McKinlay River. This gives us nesting, growth and movement data on these animals over a 10-year period.

The Northern Territory is revising its management plan on the basis of data collected since 1985.

Grahame Webb and Charlie Manolis have

just released a popular book, CROCODILES OF AUSTRALIA, which explores the biology, conservation and management of both saltwater and freshwater crocodiles and is full of superb color pictures. -- Dr. Grahame Webb, P.O. Box 38151, Winnellie, N.T. 0821, Australia.

product you have purchased has been derived from a carefully researched management program designed to ensure the long term conservation of crocodiles.

Papua New Guinea:

PAPUA NEW GUINEA'S CROCODILE MONITORING PROGRAM: 1989 UPDATE. Direct monitoring of Papua New Guinea's crocodile resource continues to be primarily accomplished by annual nest counts in the Sepik River region, source of more than 40% of the country's crocodile skin exports. Because similar exploitation patterns exist in other areas of the country, Sepik results are felt to reflect the status and trend of crocodile populations throughout the country.

Crocodylus porosus nest counts conducted in March showed, in comparison to the 1988 count, an 11.2% increase in the total number of nests. However, on a habitat-weighted basis, there was a decline of 2.6%. At any rate, since 1982, the nesting index has risen by 50.8%, which equals a mean per annum increase of 6.0%. Human exploitation of nests in the 1989 survey sample (10.4%) was up from the lower levels in the past, but still well below the 30-35% observed levels before conservation-oriented egg harvests began. This year 20.8% of active nests (= 20 clutches; 1,329 eggs of which an amazing 1,198 (90.1%) appeared viable at the time of collection) were aerially harvested and thereafter incubated with 85% hatching success at Mainland Holdings in Lae.

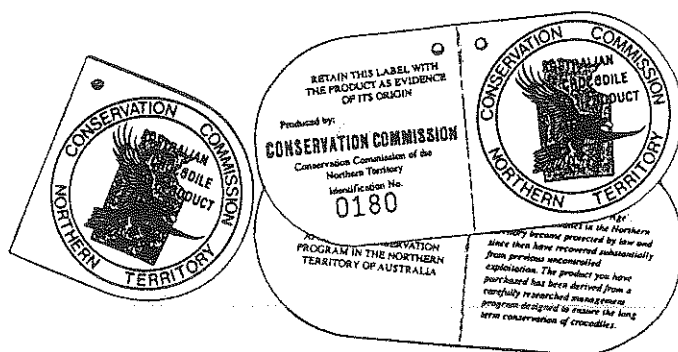
Nest counts of the New Guinea freshwater crocodile, *C. novaeguineae*, were carried out during the peak season nesting in October. On a habitat-weighted basis there was a 5.9% decline compared to the 1988 replicate. The most seriously affected areas were around Ambunti and downriver, but many upriver sites showed healthy increases. Overall, the nine year index is up by 21.9% (or 2.5% per annum). A 'freshie' egg harvest was conducted for the second consecutive year. Clutches were aerially gathered from 34 (20.4%) of 167 nests sighted on the survey, with an additional 15 clutches obtained on terrestrial forays to sequestered nesting sites. The harvest yielded 1,708 eggs, of which 1,374 (80.6%) appeared viable at

Rob Jenkins, Australian National Parks and Wildlife Service, GPO Box 636, Canberra, A.C.T., reveals that the Conservation Commission of the Northern Territory (CCNT) has produced a small serially numbered identification tag for attaching to crocodilian products sold retail. The tag folds in half making it roughly 5 cm (2 inches) across. The outside has the emblem of the NT Conservation Commission on the right half and the identification number and suggestion that the label be retained as evidence of the origin of the product on the left half.

The inside of the tag carries the following statement:

A WILDLIFE PRODUCT DERIVED FROM A SPECIMEN TAKEN IN ACCORDANCE WITH AN APPROVED CONSERVATION PROGRAM IN THE NORTHERN TERRITORY OF AUSTRALIA.

Crocodiles are living remnants of a group of reptiles that roamed the Earth during the 'Dinosaur Age'. In 1971 all crocodiles in the Northern Territory became protected by law and since then have recovered substantially from previous uncontrolled exploitation. The



Clockwise from the left: Folded CCNT crocodile product tag; outside of opened tag; inside of opened tag (1/2 size).

the time of collection. These were subsequently transferred by an unnerving charter flight to the Mainland Holdings walk-in incubator. On a most encouraging note, only one of the nests (0.4%) spotted on the survey was human-raided, which indicates that recent egg harvests are effectively reinforcing protection of nesting females and their offspring. -- Jack Cox, (former FAO crocodile monitoring officer in PNG) P.O. Box 969, Jayapura 99001, Irian Jaya, Indonesia, and John-Mark Genolagani, Senior Ecologist, National Crocodile Project, Dept. Environment & Conservation, P.O. Box 6601, Boroko, N.C.D., Papua New Guinea.

CENTRAL AMERICA AND CARIBBEAN

Cuba:

CROCODILE MANAGEMENT IN CUBA. In Cuba there are three important areas populated by crocodiles.

1. Zapata Swamp - the largest area, located in the western part of the isle where large numbers of the two crocodile species (*C. rhombifer* and *C. acutus*) that inhabit our country are found. Also found here -- though not frequently -- are animals that have characteristics of both species, the so-called 'Mixturado'.

2. Birama Swamp - situated in the southeastern part of the isle, is highly populated by American crocodile (*C. acutus*).

3. Lanier Swamp - in the Isle of Youth (or Isle of Pines, as it was formerly known), was inhabited by both Cuban crocodiles (*C. rhombifer*) and American crocodiles. In 1959, a Colombian species of caiman (*Caiman crocodilus fuscus* according to the late Dr. Varona) was introduced in this zone. This resulted in a great proliferation of caiman, while Cuban crocodiles are now gone from this area.

Cuban crocodiles were almost exterminated by indiscriminate hunting, particularly in Zapata and Lanier swamps. In 1959, the Crocodile Hatching Center was founded in Zapata Swamp with three objectives in view: to preserve the species, to serve as a tourist resort, and to support a handwork industry. For this reason, the two species were captured and confined together, which resulted in their uncontrolled hybridization.

In 1967, crocodile hunting was forbidden

permanently, and in 1982, Decree 103 was passed regulating non-commercial fishing. There also is a body of forest guard belonging to the Ministry of Agriculture who protect the flora and the fauna. For nearly twenty-two years crocodile hunting has been prohibited and farming has been developed with non-commercial purposes.

In 1969, a team of Cuban investigators on the farm began studies on reproduction, hematology, biochemistry, and other topics. Good results were being obtained. In 1974, I started working in this project trying to separate the two Cuban species. Now we have two breeding pens of *C. rhombifer* which have been genotypically selectee, and we are setting up a new pen for *C. acutus*. Unfortunately, after obtaining some good results in the electrophoretic characterization of these species, lack of foreign exchange to buy the necessary reagents forced us to stop the work.

Besides operating this farm in Zapata Swamp, at present the Ministry of Agriculture also is implementing a program for the development of crocodile hatching centers. Four more farms have been set up and three of them are working with *C. acutus*; one is devoted to both the reproduction and rearing, and the other two only rear this species. The newly hatched crocodiles come from the natural surroundings, and a number of them are later freed in this zone. The fourth operation is a closed cycle farm for Cuban crocodile breeding. The farm staff has been well trained in our center in Zapata Swamp. Together we developed a project to study the wild population in these important areas, and we have already initiated the project this year. Actually, the counting of crocodiles in Zapata Swamp is very difficult because the known counting methods cannot be applied due to the characteristics of this region. We have explained this to Mr. Gorzula, Mr. Ottenwalder, Mr. Webb, and other friends, and we have asked them for advice.

As you can see, in Cuba we have been trying to enhance the breeding of the two species, and to study the wild population, so as to strengthen a future rational use of this important resource.

Crocodile meat trade is carried out by the Industry of Tourism. We sell at the price of \$2.45 per kg. Up until now, the crocodile skin that we produce has brought very low prices so we have been reviewing its price. -- Roberto Ramos Targarona, Depto 'Crias Experimentales', Ministerio Industria Pesquera, Barlovento Santa Fe, Ciudad Habana, Cuba.

Honduras:

The survey of *Caiman crocodilus fuscus* and *Crocodylus acutus* in Honduras was completed in June 1989. Mario Espinal, Honduras Department of Renewable Natural Resources, surveyed the central, western, and southern rivers, lakes, and estuaries of Honduras. Carlos Cerrato, Department of Biology, National Autonomous University of Honduras, surveyed the eastern drainages, particularly in the Mosquitia region. These surveys indicate that caimans are most abundant in Mosquitia, though hunting has drastically reduced their numbers in many waterways. Crocodiles are most numerous in the central and southern regions but nowhere are their populations large enough to sustain a wild hunt. The separate reports submitted by Mario and Carlos were consolidated into one by Prof. F. Wayne King, coordinator of the survey. The combined report has been submitted to the CITES Secretariat for transmittal to the Director General of Renewable Natural Resources of Honduras.

The report contains the first data on the status of the two crocodilians species in Honduras, since Earl H. (Duke) Klein surveyed lagoons in Mosquitia in 1975-77. It also includes recommendations on quotas and size limits on caimans hunted from the wild, and on the

capture of live crocodiles for stocking farms in Honduras and neighboring countries.

Jamaica:

Elma Shelley, Administrative Assistant to the Managing Director, indicates that Tanners Limited, P.O. Box 200, Kingston 11, is planning to establish a Crocodile Farm and Research Centre in Jamaica. The farm will breed *Crocodylus acutus*. The Department of Zoology of the University of the West Indies has been invited to participate in the planning, design and operation of the centre. A survey of the local crocodile population is expected to get underway in January 1990.

EUROPE

Federal Republic of Germany:

Dr. Dietrich Jelden, c/o Bundesamt für Ernährung und Forstwirtschaft, Adickesallee 40, 6000 Frankfurt am Main, FRG, recently asked the CITES Secretariat why the Edwards River Crocodile Farm, Queensland, Australia, was listed among the CITES registered captive breeding farms for *Crocodylus porosus*. Dietrich in no way disputes that Edwards River breeds *C. porosus*. As he explains in his letter to CITES,

To my knowledge only operations breeding Appendix I species can be registered by the CITES-secretariat.

The saltwater crocodile population of Australia... [has been] in CITES Appendix II since 1985. Therefore, how... [is it that in] CITES-notification no. 407 dated 11.08.86 the Edward River Crocodile Farm in Queensland was registered.

Jaques Berney, Deputy Secretary General of CITES, answered,

As a matter of principle, you are correct in believing that the registration of the



Mario Espinal with *Crocodylus acutus* captured during survey.

Australian operation breeding *Crocodylus porosus* in captivity for commercial purposes should not be cited in the CITES Register. However, please note firstly that this operation was listed in the Register before the Australian population of *Crocodylus porosus* was transferred from Appendix I to Appendix II (see Notification to the Parties No. 336 of 25.01.1985), Notification No. 407 being essentially a summary of other Notifications on the subject.

In addition, the species *Crocodylus porosus* being still listed in Appendix I (except some populations), it is the feeling of the Secretariat that it is reasonable to keep the operations breeding it in captivity in the register, even if they are established in a country, the population of which is in Appendix II.

This response did not satisfy Dietrich, who replied,

According to CITES-Resolution 4.15 the Secretariat was requested to compile a register of operations which breed species in Appendix I in captivity for commercial purposes. Additionally Res. 4.15 states, that only specimens of species included in Appendix I that originate from an operation which is registered by the Secretariat, may be entitled to the exemption provided for by Article VII.4 of the Convention.

As these strict regulations of Res. 4.15 only apply to an Appendix I species but both Australian crocodilians are in fact listed in CITES-Appendix II, there is to my opinion no need to maintain the "Edward River Crocodile Farm" in the CITES register. Moreover the registration might only cause confusion as management officials of countries involved in crocodilian hide trade and not always familiar with current CITES rules might assume that for instance skins or other derivatives from this farm are subject to stricter measures than any products taken from wild animals or other farms in Australia.

The CSG Deputy Chairman, Prof. F. Wayne King, became involved with the very same issue but on the opposite side from Dr. Jelden, when

the late Graham Goudie asked for assistance in getting the Mainland Holdings Ltd. *C. porosus* and *C. novaeguineae* farm and ranch in Lae, Papua New Guinea, registered. Graham's reasoning was perfectly logical despite the PNG crocodile populations being on CITES Appendix II. All of Mainland Holdings exports to international buyers have been made under PNG and CITES permits, yet Graham found that potential buyers who knew that some populations of *C. porosus* were listed on CITES Appendix I, but were not familiar with the Mainland Holdings operation, would ask if their operation was legal and if the hides they shipped involved Appendix I species. Graham rightly believed that having the farm listed on the CITES register would remove any doubt about the legality of the Mainland Holdings operation. For this reason, Iamo Ila, the head of the Papua New Guinea delegation at the October 1989 CITES conference in Lausanne, Switzerland, submitted a formal request to the CITES Secretariat to have the Mainland Holdings operation listed on the CITES register.

Since customs and wildlife officials who inspect shipments and permits in the importing nations cannot possibly be familiar with every captive breeding operation, the original purpose of the CITES register of farms was to enable those officials to identify which are legitimate captive breeding programs for Appendix I species and which might be fronts for the shipment of hides poached from the wild. Similarly, CITES maintains a list of recognized natural history museums, herbaria, and systematics collections to help customs and wildlife inspectors identify which are legitimate and which might be a cover for shipping poached hunting trophies or commercially valuable specimens or products. Those same officials would benefit from a list of legitimate crocodile farms regardless of whether or not they produce Appendix I crocodilians or only Appendix II species. If any customs or wildlife inspectors are confused by including Appendix II farms in the register, than a separate list would seem to be in order.

United Kingdom:

ESTIMATES OF LEGAL CROCODILIAN SKIN PRODUCTION: 1988. I put together the following legal crocodilian skin production estimates for the 1988 FAO fisheries production yearbook.

Crocodylus niloticus

Botswana	0	(CITES proposal)
Cameroon	0	
Congo	150	(CITES proposal)
Israel	300	(Perry, pers. comm.)
Kenya	1,400	(Hutton)
Madagascar	3,800	(Quota)
Malawi	1,400	(CITES proposal)
Mozambique	1,000	(1987, also 1988 Hutton)
South Africa	258	(1987 exports)
Sudan	5,000	(Quota)
Tanzania	1,800	(Quota)
Zambia	5,600	(CITES proposal)
Zimbabwe	10,700	(Hutton, pers. comm.)

Crocodylus cataphractus

Congo	600	(CITES proposal)
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Crocodylus porosus

Indonesia	3,104	(CITES proposal, 7000-10000 unofficially)
Papua New Guinea	5,645	(1988 export)
Australia	1,248	(1988 export)
Solomon Islands	300	(King, pers. comm.)
Thailand	683	(farm statistics)

Crocodylus novaeguineae

Indonesia	11,998	(20,000 unofficially)
Papua New Guinea	17,031	(1988 export)

Crocodylus johnstoni

Australia	1,240	(1988 export)
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Crocodylus siamensis

Thailand	1,865	(farm statistics)
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Osteolaemus tetraspis

Congo	10	(CITES proposal)
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Caiman crocodilus

Guyana	47,013	(7,000 in 1989)
Venezuela	150,000	(Medina, pers. comm.)
Honduras	6,000	(CITES MA, pers. comm., same in 1989)

Alligator mississippiensis

U.S.A.	62,647	(USFWS via FAO)
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Total	340,972	
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I would be interested in hearing how accurate these estimates turned out to be. -- Richard Luxmoore, *World Conservation Monitoring Centre, 219c Huntington Road, Cambridge CB3 0DL, United Kingdom.*

NORTH AMERICA

United States:

Cypress Creek Farms has recently finished construction of nine new alligator 'grow-out' buildings utilizing the circular building design presented at this year's Crocodilian Congress in Tampa, Florida, U.S.A. These 16-foot diameter houses are completely insulated and enclosed to ensure temperature consistency as well as energy efficiency. The company plans to begin construction of larger 32-foot diameter houses this fall. -- Scott Anderson, *Cypress Creek Farms Inc., P.O. Box 1071, Starke, Florida, U.S.A.*

A separately bound reprint of the symposium "Biology of the Crocodilia" that appeared in volume 29, number 3 of the *AMERICAN ZOOLOGIST*, September 1989, is available from Dr. Valentine Lance, Center for Reproduction of Endangered Species, San Diego Zoo, P.O. Box 551, San Diego, CA 92112, U.S.A. The reprint is softbound, is 232 pages in length, and consists of 15 major papers, a brief biography of Professor Roland Coulson in whose honor the symposium was convened, and an afterword by Professor Carl Gans. The cost is high -- printing alone was \$9.70 per copy -- but it would have required an order of 5000 to cut the price nearly in half. Copies are available for U.S. \$10.00 prepaid, which includes postage. Please make cheques payable to the Zoological Society of San Diego, and include on the cheque the notation "account number 3-2022-875/972-Lance". U.S. dollars only, and no cash. Prepaid orders only please.

SAVANNAH RIVER ECOLOGY LABORATORY ALLIGATOR RESEARCH. Studies are currently beginning at the University of Georgia's Savannah River Ecology Laboratory to reevaluate the status and to repeat former surveys of American alligators at the U.S. Department of Energy's Savannah River Plant. In the early 1970s, head counts and nighttime



Cypress Creek Farms 'circular' controlled environment buildings for rearing American alligators.

eye-shine census routes documented the seasonal responses of alligator movements into areas where heated water from operating nuclear production reactors produced elevated temperatures in certain portions of a cooling reservoir throughout the winter. For the past two years, however; these reactors have been completely shut-down for repairs and an elegant opportunity to conduct a 'natural experiment' to now reevaluate the movement patterns and distribution of alligators in response to this removal of the former thermal gradient in the reservoir. It is hoped that some preliminary results of this reassessment can be prepared for presentation at the upcoming CSG meeting in Gainesville, Florida, U.S.A., in April 1990. -- Dr. I. Lehr Brisbin, *Savannah River Ecology Laboratory, Drawer E, Aiken South Carolina 29802, U.S.A.*

LOUISIANA ALLIGATOR FARMING PROGRAM. The Rockefeller Refuge alligator supplement programs have been ongoing since 1977. In 1989, 14 farmers received 7,175 hatchlings produced from state owned lands (see Table below). Several farmers have established breeding stock and are beginning to produce young which will eventually make these farms self-sustaining.

During the 1989 nesting season, approximately 3,737 young were produced from captive breeding herds. The majority of the captive breeders in Louisiana today are below 10 years of age.

Alligator inventory on 85 Louisiana farms prior to the 1989 hatch amounted to 67,719. Louisiana's alligator farm inventory expanded tremendously during 1989 as a result of an aggressive farm stock collection program; utilizing wild produced eggs and small young alligators. During the summer of 1989, approximately 182,671 eggs and 1,351 hatching year young alligators were collected on privately owned wetlands (see Table). The egg collection program produced a total of 143,090 young for a 79% hatching rate (see Table). These eggs and young were collected over 1,839,000 acres of coastal marsh, swamp, and lakes throughout Louisiana. As a result of the expansion program of 1989, Louisiana licensed an additional 54 farmers. The total number of farms in Louisiana is currently 85 with approximately 223,072 alligators being cultured (see Table). Also, several of the existing farms in the Rockefeller alligator supplement program expanded their operation by collecting eggs/young on private lands.

Alligator eggs collected early in incubation

1989 Louisiana Alligator Farm Stocking Program

Habitat Type	No. Collectors (Farms)	No. Landowners	Acreage	No. Eggs Collected	No. Hatch	No. Hatchlings Collected
Lakes-Swamp	5	5	14,450	1,961	1,499	0
Swamp	17	19	264,695	16,237	11,358	1,351
Marsh	32	76	1,560,475	164,473	130,233	0
Total	54	100	1,839,620	182,671	143,090	1,351

1989 Rockefeller Refuge Alligator Supplement Program	No. Farms	No. Hatchlings Distributed	Mean No. Per Farm
	14	7,175	513

Louisiana Alligator Farm Inventory as of 1 September 1989	No. Licensed Farms	No. Alligators
	85	67,719

1989 Pen Raised Alligators	No. Farms	No. Eggs Collected	No. Hatch
	10	7,629	3,737

(less than 5 days old) and transported the greatest distance hatched at the rate of 82%, three percent higher than the statewide average. These eggs were collected and transported by airboats, transferred to outboard boats, and then transported 200 miles by car. However, the collection, hauling, and incubation procedures were done within 12 hours. No artificial nesting media were used. Eggs, when collected, were packed in the natural nesting media and remained in this media (media and eggs transferred to ½" mesh wire incubation boxes) until they hatched.

During 1989, 9,000 alligators (3'-4' total length) were released back into the wild as compensation for the collection procedure. This most important aspect of the collection program is governed by contractual agreements between the farmers, landowners, and Louisiana Department of Wildlife and Fisheries. In many cases, the alligators were 11 to 12 months of age and were released in the general area of the nest site. -- Ted Joanen, *Rockefeller Wildlife Refuge, Department of Wildlife and Fisheries, Rt. 1, Box 20-B, Grand Chenier, LA 70643, U.S.A.*

Penwaugh Slough, Texas, was killed and abandoned by unknown hunters. Texas wildlife officials were investigating this illegal killing. According to Gordon Henley, Ellen Trout Zoo, P.O. Drawer 190, Lufkin, Texas 75902,

Alligators over 13 feet in length are not a rarity in east Texas, I have the skulls of two specimens over 13' in my office. Both animals were found dead on the banks of Lake Sam Rayburn, less than 15 miles from our zoo.

Additionally, I would like to inform you of the work of Dr. Perry Little, Sam Houston State University, Huntsville, Texas, is doing. Dr. Little is studying the nutrition of captive alligators. He is interested in developing a diet that promotes maximum growth of alligators and is experimenting with both animal and vegetable diets. Dr. Little is using approximately 90 specimens in his research and has had good success with his animals.

SOUTH AMERICA

Colombia:

Claudia Turbay de Rojas, Director of the Colombian Government Trade Bureau office in

The 23 June 1989, LAKE LIVINGSTON PROGRESS newspaper announced that a 13 feet 9 inch long, approximately 700 pound, alligator in

Miami, Florida, U.S.A., sent a listing of 37 established wildlife farms authorized by INDERENA, 30 of which are rearing crocodilians. All of the 30 farms are producing babillas, *Caiman crocodilus*, 5 of them are also farming *Crocodylus acutus*, and 17 are also rearing other wildlife species as well, usually iguanas, boas, chiquiro (capybaras), or agoutis. An additional 7 farms rear only chiquiro, iguanas, or boas. Clearly wildlife farming is an expanding business in Colombia; the first farm was authorized in 1984, eight were authorized in 1987, 12 in 1988, and 5 in the first seven months of 1989.

Surinam:

THE IMPACT OF AN INDIAN VILLAGE ON CAIMANS. It is usually thought that the influence of tribal Amerindians on animal populations is small. Here I present a case where the population growth of an Amerindian village has caused the decline of caimans over a large part of the river concerned.

Trio Indians consider caimans a delicacy and in December they even organize a special festival during which a number of caimans are caught and consumed.

Formerly, Trio Indians were hunters and gatherers wandering around in small groups in the forests of southern Suriname and northern Brazil. Since their numbers were declining rapidly, some missionary organizations tried to offer medical and other services. This caused the Indians to concentrate around the airstrip and

medical center and changed their way of life into a more sedentary one. Their numbers increased so much that soon they had to move to another village. This new village was situated along a larger river, the Sipaliwini. These forest Indians are mainly river Indians. This village, the Kwamalasumutu, has now a population of about 1100 people.

The table below shows the number of caimans counted at different distances from Kwamalasumutu.

This clearly shows the influence this village has on caimans. In the village no caiman remain, further off (40-60 km) only the very shy caiman survive. Still, it is unlikely that caimans will be completely exterminated in the near future, since their habitat extends into the small tributaries which are almost inaccessible to man. -- Paul E. Ouboter, *Department of Zoology, University of Suriname, P.O.B. 9212, Paramaribo, Suriname.*

Venezuela:

Cecilia de Blohm, Secretary of the Council, Fundacion para la Defensa de la Naturaleza (FUDENA), Apto. Postal 70376, Caracas 1071A, sent in a copy of THE VENEZUELAN RECOVERY AND REINTRODUCTION PROGRAMME FOR THE ORINOCO CROCODILE, *CROCODYLUS INTERMEDIUS* that is being coordinated by FUDENA.

The proposal's 'Summary' states, Since 1978 considerable efforts have been made in Venezuela towards the conservation of the endangered Orinoco

Numbers of caimans occurring in the vicinity of an Amerindian village in Surinam.

Surinam Waterways	Distance in km to village	----- caimans / km -----		
		<i>Paleosuchus trigonatus</i>	<i>Paleosuchus palpebrosus</i>	Unidentified caimans
Coeroeni/Sipaliwini	71-89 downstr.	0.5	0	0.06
Coeroeni/Sipaliwini	24-30 downstr.	0.17	0	0
Coeroeni/Sipaliwini	12-17 upstr.	0	0	0
Wioemi Creek	18-33 upstr.	0*	0	0
Coeroeni/Sipaliwini	45-47 upstr.	0	0	0.5
Coeroeni/Sipaliwini	62-66 upstr.	0	0	0.75
Akalapi Creek	66-72 upstr.	0.5	0	0
Vier Gebroeders Creek	110-119 upstr.	0.33	0.33	0.11
Coeroeni/Sipaliwini	115-122 upstr.	0.14	0	0
Koewini Creek	> 120 upstr.**	1.0	0	0

* Lower jaw of *P. trigonatus* found at Amerindian camp.

** Creek inaccessible by water.

Crocodile (*Crocodylus intermedius*). To date, the status of the remaining wild populations have been identified; three major captive breeding centers are currently active and two areas have been legally declared for their protection, recovery and/or reintroduction. This proposal summarizes the conservation actions needed to propitiate the recovery of the species in Venezuela.

The proposal seeks funding for a release program for captive-bred crocodiles, for monitoring their movements, and by establishing a group of wardens to protect the crocodiles in the new parks and reserves.

FUDENA will present the proposal at the CSG 10th Working Meeting in Gainesville in April 1990.

AN ANALYSIS OF THE SIZES OF HIDES OF CAIMAN *CROCODYLUS* HARVESTED IN THE VENEZUELAN LLANOS DURING THE 1989 SEASON. During the past seven years commercial harvests of *Caiman crocodilus* have been carried out in the Venezuelan Llanos (Table 1).

The management model is based upon the premise that a selective harvest of large males (Table 2) will not affect the reproductive potential of the species. Cattle ranches are given licenses for 15% to 35% of the estimated number of adult males (class IV), which represents a quota of 7% to 15% of the overall non-hatchling population of caimans.

Large caimans have very ossified belly skins. Therefore, only the flanks (and the tail of smaller animals) are harvested. A pair of flanks, joined anteriorly by the throat skin, is referred to as a

Table 1. Summary of Venezuelan Commercial Harvests 1983-1989.

Year	Licensed Ranches	Skins Harvested	Salted Meat (12 kg/unit)
1983	50	2,214	1,856
1984	55	72,612	28,780
1985	178	232,063	110,357
1986	-----one year ban-----		
1987	197	102,689	64,456
1988	304	153,103	45,000
1989	577	137,274	80,000
	Totals	699,955	330,449

Table 2. Life Classes of *Caiman crocodilus*.

Life Class	Life Stage	Snout-Vent Length Range	Usual % in Llanos Population
0	Eggs in nest	-----	
I	Hatchlings living in distinct pods	0.11-0.19 m	not included in census report
II	Juveniles in dispersal phase (both sexes)	0.20-0.59 m	17.6%-44.8%
III	All adult females & some adult males	0.60-0.89 m	40.2%-65.0%
IV	All males bigger than largest female	0.90-1.40 m	14.9%-26.0%

Table 3. Grades of *Caiman crocodilus* 'Chalecos' and Their Corresponding Sizes in Meters and Life Classes.*

Grade of Chaleco	Size of Chaleco	S-V Length	Total Length	Life Class	Male:Female Ratio
'Super'	>1.4	>1.26	>2.29	IV	1:0
'1'	>1.3	>1.16	>2.12	IV	1:0
'2'	>1.2	>1.05	>1.93	IV	1:0
'3'	>1.10	>0.94	>1.74	IV	1:0
'4'	>1.00	>0.83	>1.55	III/IV	1:1 (est.)
'5'	>0.90	>0.73	>1.37	III	1:2

* After Rivero-Blanco, C. 1985. Evaluación de Algunos Aspectos de la Temporada de Aprovechamiento de la Especie Baba, *Caiman crocodilus*, de 1985. Unpublished internal report of the Dirección General Sectorial de Administración del Ambiente, Ministerio del Ambiente y de los Recursos Naturales Renovables, Caracas, Venezuela. 104 p.

Table 4. The Size Distribution of 'Chalecos' from the 1989 Harvest.

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Total
Total	13,946	14,099	7,066	1,981	407	37,499
Total %	37.2%	37.6%	18.8%	5.3%	1.1%	100.0%
Males	13,946	14,099	7,066	>990	136	>13,237
% Males	100.0%	100.0%	100.0%	50.0%	33.3%	>96.6%
Females	0	0	0	<991	271	<1,262
% Females	0.0%	0.0%	0.0%	50.0%	66.7%	<3.4%

chaleco. In Venezuela, for the purpose of sale the *chalecos* are classified into six grades according to their length measured from the tip of the throat to the base of a hindleg (Table 3). Females are only represented in grades 4 and 5.

Table 4 is the analysis of 37,499 *chalecos* harvested on 148 ranches during the 1989 season. The Grade 'Super' has been included with the Grade '1'. It is estimated that less than 3.4% of the animals harvested were females. Although the Venezuelan program has room for improvement from the administrative and control aspects, these figures indicate that very large males are being selectively harvested. Thus, from the biological point of view, the resource is still abundant. -- Stefan Gorzula, Apartado 65260, Modulo de Chuao, Caracas 1065-A, Venezuela.



ZOOS



Gladys Porter Zoo, Brownsville, Texas, U.S.A., has just had 7 *Crocodylus mindorensis* hatch from a clutch of 13 eggs resulting from the successful mating of one of their males with a captive produced female provided by the Silliman University project run by Professor A. Alcala. Incubation took 73 days. It is believed that these are the first *C. mindorensis* bred and hatched outside the Philippines. The zoo has had two male Philippine crocodiles since 1973 and obtained two females from Silliman on 1 October 1988. Offspring will be returned to the Silliman University breeding colony.

TRADE



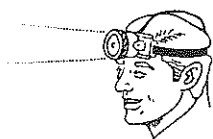
The following prices (in U.S. dollars) paid to hunters, farmers, or other producers were reported to the editor since the last issue of the NEWSLETTER appeared:

Alligator mississippiensis in Florida, U.S.A.:

September - wet salted belly hides from farm reared alligators = \$5.50 per cm width (across the board for all grades and sizes);
November - wet salted belly hides from farm reared alligators = \$6.65 per cm width (for all grades and sizes).

Alligator mississippiensis in Texas, U.S.A.: July - fresh tail meat from wild alligators = \$5.00 per pound; mixed white and dark meat = \$4.00 per pound.

PERSONALS



Prof. Herbert
Dessauer, Dept.
Biochemistry and
Molecular Biology,

Louisiana State University Medical Center, 1901 Perdido Street, New Orleans, Louisiana 70112, U.S.A., reports that he is,

...initiating a study of the molecular genetics of the American alligator. Blood samples will be used to obtain protein and nucleic markers on individual gators.

Data will act as a source of information for studbooks, tests of diversity in Louisiana populations, tests to determine whether a brood of gators can be fathered by more than one male, and for a test concerned with breeding white forms.

Ted Joanen and Lew Densmore are collaborating with me in these studies.

Tony Håkansson completed his work in Nicaragua and returned home to Sweden by way of Australia where he spent some time in the field pursuing crocodiles and crocodile biologists.

His present address is: Skogsbacken 10, 17241 Sundbyberg, Sweden.

Graham Goudie passed away on 16 October 1989 in Sydney, Australia, after a short illness.

Graham first became involved with the commercial aspects of crocodiles in the early 1970s. This was when I approached him for backing in what is now the Mainland Holdings Croc Farm, Ltd.

The period from the moment we started talking about the possibility of large scale croc farming until the day he died was a kaleidoscope of intense learning, heartache, failures, and also a fair degree of success. Everything that Graham undertook had to be fully understood. A slow learning curve was not possible at the pace he worked. He attacked the subject with a verve most people found blistering -- this was true of all facets of Graham's life. He was an accomplished water skier and scuba diver, and was interested in all types of fishing. When PC computers came on the market, Graham had to have one and within a few weeks he was writing his own programmes, and in a few years he became quite an expert on the subject. Without doubt, crocodiles were no exception.

Conservation issues were close to Graham's heart, both within PNG and overseas, and it was his wish to become very involved in both the CSG and conservation generally on an international level.

Graham is survived by his wife, Annette, sons, Stewart and Craig, and daughter, Jodi.

Those who were fortunate enough to have known Graham were enriched by the experience. He was truly a wonderful gentleman. -- Greg Mitchell, Mainland Holdings Crocodile Farm, Pty. Ltd., P.O. Box 196, Lae, Papua New Guinea.

Shlomi Ranot announces that the International Crocodilian Farmers Association is about to launch a semi-annual Crocodile Farmers Magazine. He states,

...as farmers and ranchers we see the need for a professional publishing to provide us with the up-to-date research information

regarding the management and techniques of our industry.

We wish this magazine to become a major tool for the farmer's daily activities and decision-making. We hope our scientific colleagues and experienced farmers could use our magazine to publish their studies and ideas to be implemented in this industry.

The magazine will be published in New York and edited by Myrna E. Watanabe with the help of Peter Brazaitis, and me. The cost will be born by ICFA, using annual membership fees.

In the future we will consider opening it for advertisement as a secondary way of financing.

The first issue will go to press the last week of February and will be distributed before the end of March. We will appreciate it if you send us your comments, research papers, ideas, or any other materials you feel is useful to farmers elsewhere. Please mail the material to: International Crocodile Farmers Association, 475 Fifth Ave., 23rd Floor, New York, NY 10017, U.S.A.

Dr. Chris Kofron, continues his survey of the crocodiles of Liberia, including Sapo National Park. He also has a new address: Dr. Christopher P. Kofron, U.S. Educational and Cultural Foundation in Liberia, P.O. Box 1011, Monrovia, Liberia.

Dr. Dietrich Jelden, c/o Bundesamt für Ernährung und Forstwirtschaft, Adickesallee 40, 6000 Frankfurt am Main, Federal Republic of Germany, reports,

I have had close contacts with Jon Hutton during the past few months. Because of my initiative, the "Internationaler Reptillieder-Verband" (IRV) in Offenbach agreed to make a donation of 10 000 DM for the CITES-Nile Crocodile Project in Africa. Jon had proposed to give the money to Ian Games, to conduct a survey in September/October this year in Tanzania. Ian received the money on 18.09.89 and should be already roaming around in croc habitats in Tanzania.

Franklin D. Ross, Department of Herpetology, Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, U.S.A., writes,

My most recent research has been into Madagascar fossil *Crocodylus* with Andy [Charles A. Ross], and a critical analysis of the methods we use for recording size and shape of crocodilian skulls and whole animals. There is room for improvement in skull measurements especially, and Greg [Greg Mayer] and I now think in terms of caudal length and precaudal length which includes the cloaca as part of the body.

Kenneth Geiger, Swampy Acres Gator Farm, 2914 Kenilworth Blvd., Sebring, FL 33870, U.S.A., reports that,

Swampy Acres Gator Farm and Agri-Chemical, working together over the past ten years, have developed a supplement (spoofed by the editor as 'pixie dust' in the 1988 NEWSLETTER) of some value to farmers and possibly to other reptile farmers as well.

This mineral supplement is intended to supply the needed bone building capability to alligators to allow maximum growth in the first two years. I have also found it works quite well on breeders in improving quality egg production.

Anyone interested in this supplement, or who has questions concerning the ingredients, can contact Ken.

Prof. Gordon Grigg, Dept. Zoology, University of Queensland, St. Lucia, QLD 4067, Australia, writes that he is,

...starting to get into some more crocodile work and have just taken on a graduate student who will be looking at thermal relations in crocs in the field using radio telemetry. We also have some work on sense organs and some other bits and pieces on physiology about to start early next year.

Jaime de la Ossa Velasquez, Calle 23A, No. 15-06, Sincelejo (Sucre), Colombia, is a biologist

who has been assisting breeding farms in Colombia for the past two years. He reports that he has successfully bred *Caiman crocodilus fuscus* and *Iguana iguana*, and this year hopes to begin research on *Crocodylus acutus*.

Prof. Angus Bellairs, 7 Champion Grove, London SE5 8BN, U.K., says that he is, ...much enjoying retirement, and am trying, rather unsuccessfully, to write novels in my old age.

Peter Bayliss, c/o Griffith University, Division of Australian Environmental Sciences, Nathan, Queensland Q4111, Australia, has left his position with the Queensland National Parks and Wildlife Service. He reports that he,

...no longer works on the estuarine crocodile research-management program at Weipa, Queensland. At present I am a biological consultant to various government departments in population monitoring and harvest/control programs. I am still active in modelling population/harvest dynamics of estuarine crocodiles. I am currently modelling the predicted impact of different size-based harvest strategies of estuarine crocodiles under varying degrees of environmental randomness (rainfall and water level fluctuations) and density-dependency, using Harry Messel's survey data from the Liverpool-Tomkinson and Blyth-Cadell rivers in the Northern Territory. I also am using those data to model 'minimum viable population size' and 'extinction thresholds' for estuarine crocodiles. I hope that these models will be merged with future detailed knowledge of movement patterns in order to establish the minimum size of habitat needed for maintenance of a viable population--an important concern for establishing reserves and National Parks in the face of habitat destruction, fragmentation, and hunting pressure. I hope that the experimental results from Weipa will test, improve or discard these models. I will spend some time in February/March/April 1990 with Bill Magnusson in Brasil to gain much needed

experience and debate for his new found modelling quest.

REQUESTS



In a recent issue of SCIENCE, Griffith *et al*, reviewed 700 translocations involving mammals and birds, primarily game, endangered, and

threatened species, to determine the effectiveness of translocations and what factors contributed to the success or failure of the translocation. They found, not unsurprisingly, that most translocations had been failures, especially those involving species with declining populations.

As a result of discussions during the First World Congress of Herpetology, Richard Seigel and I decided to do the same for reptiles and amphibians. In this regard, I am seeking the assistance of the IUCN Crocodile Specialist Group. What I need is information on crocodile translocations, releases, or restocking efforts, e.g., the success, failure, or even whether there was any follow-up to crocodilian introductions. -- Dr. C. Kenneth Dodd, Jr., *National Ecology Research Center, U.S. Fish and Wildlife Service, 412 NE 16 Ave., Rm. 250, Gainesville, FL 32601, U.S.A.*

Quite a few people have requested that as a service to the 'crocodilian community', the NEWSLETTER should publish a list of the publications that have appeared during the past year. The last time we published such a list was in 1988. We would be happy to publish lists of current publications, but that is possible only if people send copies of their papers to the editor. Help the NEWSLETTER recipients; be sure the editor receives copies of your publications.



REVIEWS



CROCODILES AND ALLIGATORS. Edited by Charles A. Ross. 1989. Golden Press Pty. Ltd., Silverwater, Australia. 240 p. \$35.00 (cloth).

CROCODILES AND ALLIGATORS, a new book about the Order Crocodylia, appeared in bookstores this fall. This professionally produced volume, primarily intended for the para-professional and the interested lay person, consists of three major divisions divided into fifteen chapters. Twenty-five contributing authors collaborated, lending their expertise, on a wide variety of topics ranging from evolution to biological parameters, to modern day farming and conservation trends. The excellent color photographs alone are worth the price of the book. It serves as a useful introduction, providing basic information supplemented with color illustrations.

CROCODILES AND ALLIGATORS is an overview of this fascinating but misunderstood group of reptiles. The first division entitled "Evolution and Biology" consists of four chapters, "The Place of Crocodilians in the Living World," "Evolution," "Structure and Function," and "Living Crocodilians." The first two chapters discuss the evolutionary history of this ancient Order culminating in the twenty-two extant species. Within these chapters, the section "Principles of Scientific Animal Classification" explains the cladistic and phenetic systematics employed by paleontologists in their attempt to classify the origins of the species. This section, confusing to this reviewer, inaccurately refers to the tuatara as "a species of lizard." The high points are the sections on "Specialization and Parallel Evolution" and "Origin of Living Species." These sections trace the evolution of the most developed secondary bony palate among vertebrates and give an account of the ancestral species. "Structure and Function" is a well-written description of anatomical features that separate the crocodilians from the other reptile Orders. Of special interest are the section on "Thermoregulation" and a sidebar article "Out in the Cold" comparing thermoregulatory strategies utilized by temperate and tropical species. The tropical species exhibit

thermal avoidance behaviors, while the temperate ones use heat-seeking activities. To accommodate sensitive tropical species, crocodilian farms in temperate areas must be cognizant of this and make seasonal modification in their facilities. Unfortunately, discussion of the unique crocodilian fat body, was omitted. This vascularized, abdominal organ does not respond to conditions of obesity or malnutrition in a normal fat body manner. The fourth chapter, "Living Crocodilians," is an introduction to each species. Range maps with greater detail are needed to understand zoogeography and international commerce.

"Behavior and Environment," the second division, encompasses a diverse array of topics in five chapters, "Food and Feeding Habits," "Mortality and Predators," "Social Behavior," "Reproduction," and "Habitats." In explaining cooperative feeding behaviors and methods of obtaining food, "Food and Feeding Habits" provides insight into the crocodilian's high degree of intelligence. "Social Behavior" reinforces this understanding with descriptions of the complex breeding behaviors and social hierarchies. The articles "Birth Defects in American Alligators," "Sex Determination," and "Termite Mounds as Nest Sites" should be useful to crocodilian farmers. Understanding the importance of incubation temperature is critical to successful production of healthy, known-sex hatchlings. The chapter "Reproduction" would have been enhanced by including the saltwater crocodile. "Habitats," discusses the important role that crocodilians, as keystone species, contribute to maintaining healthy aquatic ecosystems. "The Destruction of Crocodilian Habitats" is a section that should alarm every conservation minded person about the plight of this group of reptiles. The destruction of rainforests alters crocodilian 'microhabitats' leading to their demise.

The third division, "Crocodilians and Humans," has six chapters emphasizing the interactions between man and the order Crocodylia. They are "Mythology, Religion, Art, and Literature," "Attacks on Humans," "Crocodile-Skin Products," "The Trade in Crocodilians," "Ranching and Farming," and "Conservation and Management." "Mythology, Religion, Art, and Literature" recounts our dynamic relationship with crocodilians, originally one of deification and worship progressing to one of fear and disgust. "Attacks on Humans"

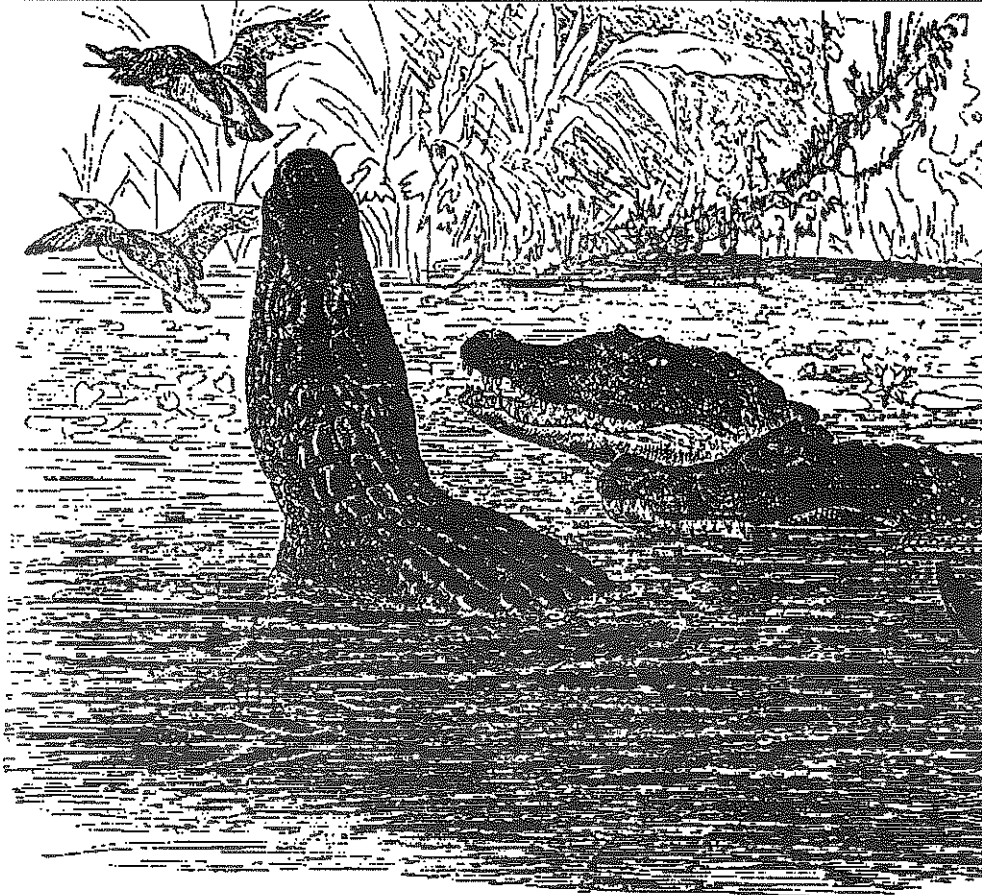
concentrates on three species, Nile crocodile, American alligator, and saltwater crocodile. Hunting techniques used by Nile crocodiles are described and should awaken the reader to the need for caution and respect when in crocodilian habitats. Although documentation on attacks is minimal, a good discussion about the interactions of this species with native African people is given. As a result of the people's culture, Nile crocodile attacks seem inevitable. The authors document attacks by American alligators in Florida and saltwater crocodiles in Australia. The paucity of documented cases does not correlate with the public's widespread fear. This reviewer felt the saltwater crocodile section expounded upon the animal's ability to kill men instead of emphasizing that most attacks were caused by lack of common sense on the part of the victim. Of special note is the article "Safety Precautions for Visitors to Crocodilian Areas" which provides valuable suggestions to help minimize such accidents. "Crocodile-Skin Products" is a comprehensive chapter detailing the processing of crocodilian skins from raw skins to finished leather products. The subject of the skin trade is continued in the following chapter, "The Trade in Crocodilians." The primary focus is the caiman skin trade since the majority of skins on the world market are spectacled caiman. "Ranching and Farming" presents a basic introduction to the farming industry. Although crocodilian farming occurs in many countries worldwide, three main countries are examined, the United States, Zimbabwe, and Australia. The section, "Farming in the United States," deals with Louisiana and ignores the other five southeastern states, Florida, Georgia, Texas, South Carolina, and Alabama. Zimbabwe crocodile farming is covered in several sections. "Capture, Handling, and Drugging" does not explain in depth immobilizing drugs. A veterinary viewpoint could expand this discussion. "Incubation" describes two methods successfully employed in Zimbabwe, "reburying the eggs in sand in open enclosures" outside and packing "the eggs in sand in individual boxes" inside a hothouse. The section would be beneficial to farmers if critical temperature and humidity parameters had been included. The distinguishing feature of this chapter is the description of the seven Australian farms. The extent of Australian crocodile farming is unknown to the majority of non-Australians. The article, "Comparison of Farms," shows that

tourism and conservation are alternate reasons for captive management of crocodilians. The final chapter of the book, "Conservation and Management," introduces the reader to the history and purposes of CITES. An extensive explanation is given concerning the reasons spectacled caiman populations can withstand such intensive hunting pressures while other species perish. Spectacled caiman can exploit marginal man-made habitats thereby expanding their range. In addition, this species matures "in as little as 3 years and only 1-1.6 meters (3-5 feet) in total length." Market prices encourage hunting larger animals regardless of the species. Other caimans do not reach sexual maturity until much larger and older. The full-page chart "Crocodilians Listed on CITES Appendices" complements the text. The index is functional and thorough.

CROCODILES AND ALLIGATORS is an attractive book, but it disappointed this reviewer. Throughout the book, *Crocodylus porosus* is referred to as the Indopacific crocodile. This is the first time that this reviewer has seen that name applied to the species. Dwarf caiman and smooth-fronted caiman, the generally accepted common names for *Paleosuchus palpebrosus* and *P. trigonatus*, are not used. Chapters on the pet trade, diseases and medicine, and the role of zoological gardens would have been valuable additions. A list of organizations involved in crocodilian farming, conservation, and research would be a useful appendix. The additional material would broaden the appeal of this book to researchers, farmers, field biologists, zoo personnel, herpetologists, veterinarians, and governmental agencies. The major drawback to using this book as a scientific reference is the lack of citations. The highlight of the book is the abundance of excellent color photographs. Many of these original photographs portray crocodilians engaged in a variety of displays and activities which belie the general conception of these animals as dull, slow-moving, and non-thinking creatures. Their quality and content makes the photographs some of the best crocodilian photographs published. Even with its weak points, CROCODILES AND ALLIGATORS is a well-done popular book that will educate the public on the value of the Order Crocodylia. It will be an affordable addition to any herpetological library. -- Terrell G. Heaton-Jones, College of Veterinary Medicine, University of Florida, Gainesville, FL 32611, U.S.A.

THE 10th WORKING MEETING OF THE IUCN/SSC CROCODILE SPECIALIST GROUP

23 to 27 April 1990, Gainesville, Florida, U.S.A.



**THIS IS YOUR INFORMATION
PACKET ABOUT THE MEETING.
PLAN NOW TO ATTEND!**

**10th Working Meeting
of the
IUCN/SSC Crocodile Specialist Group**

**23-27 April 1990
Holiday Inn West
Gainesville, Florida, U.S.A.**

MEETING INFORMATION

The meeting will include technical reports on the status of crocodilian populations throughout the world; discussions of current programs for the sustained utilization of prolific populations and plans for returning depleted populations to former abundance; descriptions of the latest developments in farming and ranching husbandry, including nutrition; the newest designs for captive propagation facilities; trends in international trade in crocodilian hides and meat; and research studies on reproduction, incubation, metabolism, and disease.

Participants will examine a population of large American alligators in Paynes Prairie State Preserve, will take part in nighttime airboat surveys of alligators on Orange Lake, and will visit the captive breeding facility for one of the largest collections of crocodilians in the U.S.A. Post-meeting fieldtrips will visit Florida alligator farms, the Everglades National Park, and the Okefenokee National Wildlife Refuge.

The 10th Working Meeting of the CSG is cosponsored by the Florida Game and Fresh Water Fish Commission; the Fish and Wildlife Cooperative Research Unit; the American Alligator Farmers Association; the Florida Alligator Farmers Association; the St. Augustine Alligator Farm; and the Florida Alligator Trappers Association.

WHO SHOULD ATTEND. The 10th Working Meeting of the Crocodile Specialist Group is open to anyone interested in crocodilian biology, conservation, management, and sustained utilization, including ranching and farming. If that encompasses your interests, plan to attend. More than 250 participants are expected. Registration will cost U.S. \$100.00.

LOCATION AND HOTEL BOOKING. The CSG's 10th Working Meeting will be held at the:

Holiday Inn-West Banquet & Conference Center
7417 NW 8th Ave.
Gainesville, Florida 32605, U.S.A.

A block of rooms has been set aside for the CSG which must be booked direct by each participant. Any unfilled rooms will be released on 9 April 1990, two weeks before the start of the meeting. You must book your rooms before that date. Confirmed reservations require payment of a one-night deposit in U.S. dollars. Payment can be made by check, money order, or credit card. Reservations can be made by completing the enclosed form and returning it together with payment to Holiday Inn West at the address above, or can be made by telephone or fax with your credit card.

Type of rooms and rates (in U.S. dollars) are:

Single occupancy / two double beds or one king-size bed = \$43.00

Double occupancy / two double beds or one king-size bed = \$49.00

All participants in the meeting must book their own rooms directly with the hotel. Payment must be in U.S. dollars, U.S. dollar travellers checks or money orders, or by major credit card. Foreign currency cannot be exchanged at the hotel, and it is difficult to exchange in Gainesville.

HOW TO REACH GAINESVILLE. Daily flights connect Gainesville Regional Airport (GNV) with Atlanta International Airport (ATL), Miami International Airport (MIA), Orlando International Airport (MCO), and Tampa International Airport (TPA). Taxis and a hotel van are available at the Gainesville airport. Gainesville also is served from all parts of the U.S.A. by Greyhound/Trailways bus lines. Gainesville is approximately a six hour drive by automobile north of Miami on the Florida Turnpike or I-95 (Interstate Highway 95) and I-75; 2½ hours north of Orlando on the Florida Turnpike and I-75; and 3½ hours north of Tampa on I-75.

CLIMATE AND CLOTHING. The weather in Gainesville in April is pleasant. Temperatures should be around 20°C to 25°C (70°F to 77°F) during the day and slightly cooler at night. Rain showers are possible, but should be infrequent. Dress comfortably and informally. Shorts and sandals are fine for men during the day, but long pants and shoes are usual at night.

LOCAL INSTITUTIONS AND ATTRACTIONS. Gainesville is the home of the University of Florida; Florida Museum of Natural History; Florida Game and Fresh Water Fish Commission Research Laboratory; Bivens Arm Nature Park; Morningside Nature Center; Payne's Prairie State Preserve; San Felasco State Preserve; Kanapaha Botanical Gardens; The Fred Bear Museum; Hippodrome State Theater; and Harn Art Museum. Numerous other state parks, state geological and historic sites, and national forests are within an hour's drive of Gainesville. Disney World and Kennedy Space Center are approximately 2½ hours away by car. A major shopping mall, a large shopping center, and numerous restaurants are within walking distance of the conference hotel.

SUMMARY AGENDA.

- 22 April, Sunday ■ Registration, informal mixer and cash bar.
- 23 April, Monday ■ Registration (continued).
 - Sessions on the Status of Crocodilians.
 - Workshop 1: International Trade in Crocodilian Products.
 - Audiovisual presentations.
- 24 April, Tuesday ■ Sessions on Crocodilian Management, including Farming and Ranching.
 - Workshop 2: Production of a Model Crocodilian Management Program.
 - Workshop 3: Production of a Booklet on Crocodilian Farming Methods and an Updated International Directory of Crocodilian Farming Operations.
 - Fieldtrip to survey Orange Lake alligators.
- 25 April, Wednesday ■ Fieldtrip to Paynes Prairie State Preserve, and the St. Augustine Alligator Farm Crocodilian Center.
- 26 April, Thursday ■ Sessions on Crocodilian Research.
 - Workshop 4: Action Plan for Crocodilian Conservation.
 - Barbecue and awards presentations.
- 27 April, Friday ■ Sessions on Crocodilian Research (continued).
 - Closing announcements.
- 28 April, Saturday ■ Departures for:
 - 3-day/2-night fieldtrip to Florida alligator farms and Everglades National Park.
 - 2-day/1-night fieldtrip to Florida alligator farms.
 - 1-day trip to Okefenokee National Wildlife Refuge.

The four specialized workshops will feature:

- **Workshop 1: International Trade in Crocodilian Products** - chaired by Ginette Hemley. International trade and trends will be reviewed.
- **Workshop 2: Model Crocodilian Management Program** - chaired by Dennis David. An exemplary management program for crocodilians based on both the biological needs of the species and proven methods of regulating exploitation, hunting, ranching, and marketing will be produced. Such a management program could serve as a model for nations wanting information on crocodilian management.
- **Workshop 3: Booklet on Crocodilian Farming and International Directory of Farms** - chaired by Jon Hutton. A major paper on crocodilian farming methods; including husbandry, diets, egg collection and incubation, and facilities will be produced. The paper will be included in a booklet containing an international atlas of existing farms and ranches that is being prepared by Richard Luxmoore and colleagues in the World Conservation Monitoring Centre, Cambridge, U.K.
- **Workshop 4: Action Plan for Crocodilian Conservation** - chaired by John Thorbjarnarson. The threats to crocodilian species in each range state and biogeographic region will be reviewed. The workshop also will produce a priority list of the action that must be taken to assure the conservation of the various populations.

SPEAKERS. The list of speakers is growing every day and presently includes: Cecilia de Blohm (Venezuela), Laura Brandt (U.S.A.), I. Lehr Brisbin (U.S.A.), Paul Cardeilhac (U.S.A.), Carlos Cerrato (Honduras), Jack H. Cox (Indonesia), Dennis David (U.S.A.), Ahmed Mohamed Elobeid (Sudan), Mario Espinal (Honduras), M.W.J. Ferguson (U.K.), Tadesse Hailu (Ethiopia), Ginette Hemley (U.S.A.), Huang Chu-Chien (People's Republic of China), R. Howard Hunt (U.S.A.), Jon M. Hutton (Zimbabwe), Dietrich Jelden (Federal Republic of Germany), F. Wayne King (U.S.A.), Val Lance (U.S.A.), Thomas J. Lane (U.S.A.), Jeff Lang (U.S.A.), Fred W. Leak (U.S.A.), Johan Marais (South Africa), Frank Mazzotti (U.S.A.), Clark D. McCreedy (U.S.A.), Larry McNease (U.S.A.), Harry Messel (Australia), Greg Mitchell (Papua New Guinea), Timothy O'Brien (U.S.A.), R.J. Rao (India), Juergen Schumacher (U.S.A.), Carolyn M. Sekerek (U.S.A.), Lala A.K. Singh (India), G.A. Smith (South Africa), Mark A. Staton (Papua New Guinea), Thomas Swaynham (U.S.A.), Lisa Theriot (U.S.A.), John Thorbjarnarson (U.S.A.), Brian Vernon (Papua New Guinea), Grahame Webb (Australia), Rom Whitaker (India), Howard S. Zippler (U.S.A.).

FIELDTRIPS. Three post-meeting fieldtrips will depart on Saturday, 28 April:

- a 3-day, 2-night fieldtrip to visit Florida alligator farms and the Everglades National Park, ending up at the Miami International Airport or returning to Gainesville (approximate cost U.S. \$150.00 each);
- a 2-day, 1-night fieldtrip to visit Florida alligator farms and ending up at the Orlando International Airport or returning to Gainesville (approximate cost U.S. \$90.00 each); and
- a 1-day fieldtrip to visit the Okefenokee National Wildlife Refuge and return to Gainesville (approximate cost U.S. \$50.00 each).

Transportation and lodging (double occupancy) is included in the cost. Single occupancy rooms are extra. Meals are not included. Participants will book these fieldtrips when registering at the meeting. Payment must be made at that time. Final costs depend on how many people sign up for particular trips. If insufficient people sign up for a particular trip, it may be necessary to combine trips or to cancel one.

Several people have asked about a fieldtrip to Rockefeller Refuge and Louisiana alligator farms. Transportation connections between Gainesville and Grand Chenier, Louisiana, are sufficiently difficult to preclude an organized trip. However, anyone wishing to visit Louisiana before or after the Gainesville meeting should contact Ted Joanen, Louisiana Wildlife and Fisheries Commission, Rt. 1, Box 20-B, Grand Chenier, LA 70643, U.S.A. Tel: (1) (318) 538 2165 Fax: (1) (318) 491 2595.

**10th Working Meeting
of the
IUCN/SSC Crocodile Specialist Group**

**23-27 April 1990
Holiday Inn West
Gainesville, Florida, U.S.A.**

PRESENTATIONS AND PUBLICATION OF PROCEEDINGS

PRESENTATIONS. Authors must limit their talks to 15 minutes. An additional 5 minutes will be allowed for questions and answers. Only workshops and invited papers will be allocated more than 15 minutes. Space is available for exhibiting posters and crocodilian related materials.

PROCEEDINGS. All authors are required to turn in a camera-ready copy of their manuscript no later than the day they give their presentation, so that the PROCEEDINGS OF THE 10TH WORKING MEETING may be compiled and published within 30 days of the close of the meeting. Papers that are not delivered to the editor at the meeting will not appear in the PROCEEDINGS.

Starting with the 10th Working Meeting, the PROCEEDINGS will contain the unedited manuscripts submitted by the authors. The PROCEEDINGS is a record of the papers that were presented at the Working Meeting. It is not a volume of papers updated or revised subsequent to the meeting. As such it does not require any editing, beyond numbering the pages consecutively and attaching a table of contents and a list of meeting attendees. The author, not the editor, will be responsible for proofreading the manuscript and for preparing camera-ready copy in the format outlined below. The final paper will appear in the PROCEEDINGS just the way it was submitted. Any errors in the submitted manuscript will appear in the published paper. The PROCEEDINGS will go to press within 30 days of the end of the meeting, so any manuscript that is not submitted at the meeting will not appear in the PROCEEDINGS.

MANUSCRIPT PREPARATION. All manuscripts must be typed or printed on standard weight (20 lb.) white, 8½" x 11" or A4 paper. Lightweight or 'onion skin' paper cannot be handled by the automated printing equipment and will not be accepted. Only standard 10 or 12 point Pica, Elite, Courier, or Gothic type faces, or TimesRoman print fonts, should be used. The type must be dark and crisp; faint type from faded ribbons will not be accepted. Margins must be set so the column of text, tables, figures, and photographic plates, are no more than 6" or 15 cm wide, and 9" or 23 cm high -- the layout of this NEWSLETTER fits within these limits. No enlargements or reductions will be done by the editor. The title should be typed in capitals and lower case letters. The authors name and complete mailing address should be centered below the title. Small tables, figures, and photographic plates should be inserted into the text where they are cited, while large tables, figures, and plates should be placed on separate pages at the end of the manuscript. Use sequential Arabic numbers to refer to tables in the text. Captions must be typed or printed immediately below the appropriate figures and plates, and not on separate pages. Any numbering and lettering must appear within the margins of photographs. Literature cited in the text should be listed alphabetically by author and then chronologically by year at the end of the manuscript in the following format: Author's initials and name (inverted as 'surname, initials,' for the first author only). Year. Full title. Book publisher, city. pages. or Abbreviated journal name. vol.(no.):pages. For example:

Neill, W.T. 1971. The last of the ruling reptiles. Columbia Univ. Press, New York. xvii + 486 p.
Pooley, A.C., and C. Gans. 1976. The Nile crocodile. Sci. Am. 234(4):114-124.

Pages should be sequentially numbered, lightly in pencil, in the upper righthand corner. After all the manuscripts have been assembled into the final volume, revised numbers will be printed on the pages.

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Holiday Inn West
Gainesville, Florida, U.S.A.**

Hotel Booking Form

Your name: _____

Mailing Address: _____

Telephone number: _____

- ☐ I wish a single room with double/king-size bed (U.S. \$43.00/night).
- ☐ I wish a room with two double beds (U.S. \$49.00/night). I wish to share my room with _____ (name of other registrant).
- ☐ I wish a double room with one king-size bed (U.S. \$49.00/night).

Total Amount Enclosed or Charged \$ _____ in U.S. dollars.

☐ Check ☐ Money order ☐ Visa ☐ Master Card ☐ American Express

Credit Card Number _____ Expiration Date _____

Signature _____

I will arrive in Gainesville on ____ April 1990, at ____ AM / PM, and will depart the hotel on ____ April.

I expect to arrive on _____ airline, flight _____.

Other comments: _____

■ Please complete this form and return it, together with your deposit, to:

Sales Department
Holiday Inn-West
7417 NW 8th Ave.
Gainesville, Florida 32605, U.S.A.

tel: (1) (904) 332 7500
fax: (1) (904) 332 0487
international reservations: (1) (800) HOLIDAY / (1) (800) 465 4329
U.S.A. toll free reservations: (1) (800) 426 4287

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Pre-Registration Form

Name: _____

Address: _____

☐ I plan to attend the meeting, but will not give a paper.

☐ I wish to present the following paper(s):

I will need the following audiovisual equipment:

- ☐ carousel projector for 35mm slides
- ☐ overhead projector for acetate sheets
- ☐ VCR video cassette player (only NTSC format available)

☐ I would like to exhibit the following material(s):

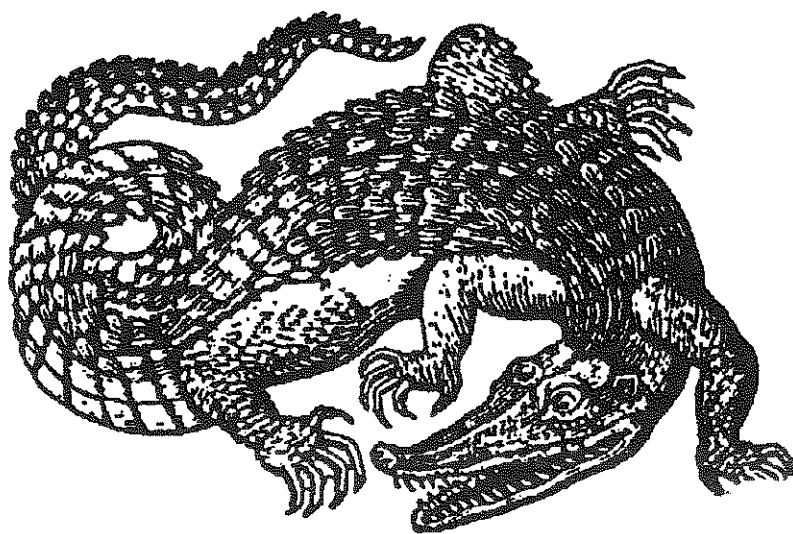
☐ I am interested in a 3-day, 2-night post-meeting fieldtrip to visit Florida alligator farms and the Everglades National Park, and end up at the Miami International Airport or return to Gainesville. To be booked at the meeting.

☐ I am interested in a 2-day, 1 night post-meeting fieldtrip to visit Florida alligator farms and end up at the Orlando International Airport or return to Gainesville. To be booked at the meeting.

☐ I am interested in a 1-day post-meeting fieldtrip to visit the Okefenokee National Wildlife Refuge and return to Gainesville. To be booked at the meeting.

■ Please complete this form and return it immediately to:

Prof. F. Wayne King
Florida Museum of Natural History
Gainesville, FL 32611, U.S.A.
tel: (1) (904) 392 1721
fax: (1) (904) 392 9367



American alligator

EDITORIAL POLICY - The newsletter must contain interesting and timely, not outdated, information. All news on crocodilian conservation, research, management, captive propagation, trade, laws and regulations is welcome. If you wonder why news from your area is not reported, it is because you have not sent it in. Whenever possible, the information will be published as submitted over the author's name and mailing address. Even if the editor has to extract information bit by bit from correspondence or other works, the revised news items will be attributed to the sources whenever possible. The information in the newsletter should be accurate, but time constraints prevent independent verification of every item. If inaccuracies do appear in the newsletter, please call them to the attention of the editor so corrections can be published in later issues. The opinions expressed herein are those of the individuals identified and, unless specifically indicated as such, are not the opinions of the CSG, the SSC, or the IUCN.

Steering Committee of the Crocodile Specialist Group

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

Chairman: Prof. Harry Messel, School of Physics,
University of Sydney, NSW 2006, Australia.
Tel: (61) (2) 692 3383 Fax: (61) (2) 660 2903.
Deputy Chairman: Prof. F. Wayne King,
Florida Museum of Natural History,
Gainesville, FL 32611, U.S.A. Tel: (1) (904)
392 1721 Fax: (1) (904) 392 9367.

Africa: Vice Chairman: Dr. Jon Hutton, 16
Cambridge Ave., Highlands, Harare,
Zimbabwe. Tel: (263) (4) 739 163 Fax: (263)
(4) 708 554. Deputy Vice Chairman: Olivier
Behra, Project TCP/MAG/8954, c/o FAO
Rep, P.O. Box 3971, Antananarivo,
Madagascar. Tel: (2) 28831 WWF Fax: (2)
40284.

Eastern Asia, Australia and Oceania: Vice
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Box 38151, Winnellie, NT 5789, Australia.
Tel: (61) (89) 221 355 Fax: (61) (89) 470 678.
Deputy Vice Chairman: Dr. Laurie Taplin,
Queensland National Parks and Wildlife
Service, P.O. Box 5391, Townsville Mail
Centre, QLD 4810, Australia. Tel: (61) (77)
741 141 Fax: (61) (77) 741 464.

Western Asia: Vice Chairman: Romulus
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Vadanemmeli Village, Mahabalipuram Road,
Perur PO, Tamil Nadu, 603 104 India.
Deputy Vice Chairman: Dr. Lala A.K. Singh,
Project Tiger, Similipal Tiger Reserve,
Khairi-Jashipur, Orissa, India 757091.

Europe: Vice Chairman: Dr. Dietrich Jelden,
Ernahrung und Forstwirtschaft, Postfach 18
02 03, 6000 Frankfurt am Main 1, Federal
Republic of Germany Tel: (49) (69) 156 4930
Fax: (49) (69) 156 4445.

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Fax: (598) (2) 237 070. Deputy Vice
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Venezuela. Tel: (58) (57) 68006 ext. 271.

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Louisiana Wildlife and Fisheries Commission,
Rt. 1, Box 20-B, Grand Chenier, LA 70643,
U.S.A. Tel: (1) (318) 538 2165 Fax: (1) (318)

491 2595. Deputy Vice Chairman: Dennis
David, Game & Fresh Water Fish
Commission Research Lab, 4005 S. Main
Street, Gainesville, FL 32611, U.S.A. Tel: (1)
(904) 336 2230 Fax: (1) (904) 376 5359.

Science: Vice Chairman: Prof. Mark W.J.
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Kingdom. Tel: (44) (61) 275 6775. Fax: (44)
(61) 275 6776. Deputy Vice Chairman: Dr.
Valentine A. Lance, San Diego Zoo, P.O.
Box 551, San Diego, CA 92112, U.S.A. Tel:
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Deputy Vice Chairman: Philippe Roggwiler,
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Toshio Yamanaka, President, Yamatoshi
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Trade Monitoring: Vice Chairman: Ginette
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219C Huntington Road, Cambridge CB3
0DL, U.K. Tel: (44) (223) 277 314 Fax: (44)
(223) 277 136.

IUCN Species Survival Commission: Chairman:
Dr. George Rabb, Chicago Zoological
Society, Golf Road, Brookfield, IL 60513,
U.S.A. Tel: (1) (312) 485 0263 Fax: (1) (312)
485 3532. Deputy Chairman: Grenville
Lucas, The Herbarium, Royal Botanic
Garden, Kew, Richmond, Surrey TW9 3AB,
United Kingdom. Tel: (44) (1) 940 1171 Fax:
(44) (1) 948 0819.

CITES Observer: Dr. Obdulio Menghi, Scientific
Coordinator, CITES Secretariat, Case postale
78, CH-1000 Lausanne 9, Switzerland. Tel:
(41) (21) 200 081 Fax: (41) (21) 200 084.