

# CROCODILE SPECIALIST GROUP

## NEWSLETTER

VOLUME 23 No. 2 • APRIL 2004 – JUNE 2004



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APRIL 2004 – JUNE 2004

IUCN–The World Conservation Union  
Species Survival Commission

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**COVER PHOTO.** During a field trip to the McKinlay River, Australia, participants of the CSG 17<sup>th</sup> Working Meeting pose with the *C. johnsoni* (Australian "freshies") they helped catch, just before releasing them. See pages 4-5 for details. J. Thorbjarnarson photo.

The CSG NEWSLETTER is produced and distributed by the Crocodile Specialist Group of the Species Survival Commission, IUCN – The World Conservation Union. CSG NEWSLETTER provides information on the conservation, status, news and current events concerning crocodilians, and on the activities of the CSG. The NEWSLETTER is distributed to CSG members and, upon request, to other interested individuals and organizations. All subscribers are asked to contribute news and other materials. A voluntary contribution (suggested \$40.00 US per year) is requested from subscribers to defray expenses of producing the NEWSLETTER. All CSG communications should be sent to the new executive office of the Chairman-elect: CSG, P.O. Box 530, Sanderson NT 0813, Australia. Tel: (618) 8-922-4500; Fax: (618) 8-947-0678; E-mail: <csg@wmi.com.au>

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## Editorial

**BIG CHANGES AT CSG.** At the Steering Committee meeting 24 May 2004 in Darwin, Australia, after extensive discussion, the Steering Committee recommended that Dr. Grahame Webb would be their preference to take over chairmanship of the CSG. Professor Messel accepted that recommendation and he will recommend Dr. Webb to SSC for appointment in November. Anticipating that SSC will approve this recommendation, Professor Messel asked Dr. Webb to immediately assume activities as "Chairman-elect" and begin to make arrangements to take over running the group full time by November. Dr. Webb has been very active as the CSG Vice Chair for the East Asian, Oceania and Australian region. He has a deep background in research and biology of crocodilians and also extensive practical and international experience. He is backed up by an outstanding team at his Wildlife Management International — Crocodylus Park facilities in Darwin and has the resources to support the chairmanship. We believe his energy and expertise will provide excellent leadership for CSG as we move forward on our crocodilian conservation agenda. We anticipate a period of transition between July and November of this year.

This will necessitate many changes in CSG organization and function. Grahame will establish the executive office of CSG at his institution in Darwin. The present Executive Officer, (Perran Ross) steps down from that position 30 June and will be taking up a new position based at University of Florida starting July 2004 assisting the State of Florida wildlife agency with conservation issues. Professor Messel asked Perran to continue to serve in a voluntary capacity as treasurer of CSG and our financial operations and procedures will continue unchanged, at least for the remainder of this year. Solicitations to Patrons for their

support will be sent out shortly and donations can be made in the usual way. This newsletter was produced by the Gainesville-based editorial team in the usual manner and a decision on editors and production location for future newsletters will be made shortly.

All routine communications regarding CSG operations should be redirected to Grahame's offices after 1 July 2004. E-mails may be sent to <csg@wmi.com.au> and phone, fax and mail contacts are those given on the last page of this newsletter. Material sent to <prosscsg@flmnh.ufl.edu> and the old address will be forwarded to Grahame. Members involved in continuing activities that bridge this transitional period should be sure to make contact with the new executive office, adjust their address books and be sure that Grahame's office is suitably briefed on their current issues and activities. We expect that it will take a few months for the new organizational structure to be fully in place and operational. We ask everyone's cooperation and tolerance during this transition. Special care will be needed to ensure that things do not "fall between the cracks" in this period and all members can contribute to this process by ensuring that their activities and communication with CSG is kept current. Communication to regional vice chairs is especially important to ensure continuity through this period.

We call on all CSG members and supporters to place their full support behind our new leadership team. Grahame has already initiated examination of CSG's Core Business at a workshop held during the 17<sup>th</sup> Meeting and the results of this workshop will form the foundation for a critical evaluation of our objectives and the structure and organization we need to meet them.

These are exciting times for CSG. After 15 years of dynamic leadership, Professor Messel will remain active in CSG, as will Perran Ross. New leadership and new structures offer the opportunity to renew our commitment to crocodilian conservation, refresh our communications and activities, evaluate recent actions and embark on new ventures and in new directions. Our strength and past success is based on the individual contributions of you our members and your active participation in this change will ensure that our strength and success continues. — Professor Harry Messel, *Chairman*, and Perran Ross, *Executive Officer*.

## CSG 17<sup>th</sup> Working Meeting Report

Between 24 and 29 May 2004, 232 members and supporters of the IUCN-SSC Crocodile Specialist Group, from 34 countries, convened in Darwin, Northern Territory, Australia for a very successful 17th Working Meeting. Wildlife Management International Pty. Limited hosted the meeting, which was held at the MGM Grand Hotel, in Darwin.

The organizing committee [Grahame Webb, Charlie Manolis, Tom Dacey, Nancy Pederson, Larry Banister, and Mike Letnic] were ably assisted by WMI staff and a band of volunteers. A large number of donors and sponsors made the meeting possible, and we are particularly grateful for those that provided direct financial support: the Northern Territory Government; the Rural Industries Research and Development Corporation, and the Key Centre for Tropical Wildlife Management, Charles Darwin University.

The first day of the meeting was devoted to the CSG Steering Committee, which handled a daunting schedule of international crocodile issues. A highlight was the recommendation of Grahame Webb as CSG Chairman-elect, to take over the CSG leadership when Prof. Harry

Messel steps down in November 2004.

The working meeting was opened by Prof. Harry Messel and the Chairman of the Species Survival Commission, Dr. David Brackett. The official opening and welcome to the NT was carried out by Dr. Chris Burns, Minister for Infrastructure, Planning, and Environment, at the Parliament House. This occasion was also used by the SSC Chairman to bestow on Prof. Messel the IUCN's highest award for conservation—the Sir Peter Scott Medal.

The working meeting started with an introductory session which served to introduce major workshops that would be held concurrently with the meeting: on skin quality, human crocodile conflicts, trade, CSG core business, conservation of *T. schlegelii*, and conservation of Siamese crocodiles.

A session on the "Conservation, Management, and Sustainable Use of Crocodiles

in Australia" reviewed each of the State and Territory programs and discussed the unique role of aboriginal people in management. This was followed by two sessions on the foundations of crocodilian conservation, which provided reviews of many issues intimately linked to crocodilian conservation today: the IUCN, CITES, compliance with CITES, Article IV of CITES, Precautionary Principle, IUCN Red List, wildlife management practices and principles, adaptive management in Louisiana, bio-economic modeling, harvesting adults, and parallels between the management of crocodiles and kangaroos in Australia.

The next session examined actions being taken with some of the most endangered species: Chinese alligators, Siamese crocodiles; *T. schlegelii*, and Muggers in Iran. It was followed by a series of sessions on management case histories from Cambodia, Sri Lanka, the Philippines, Sarawak, Gabon, Congo, Bolivia, Sabah, Venezuela, Argentina, Bangladesh, and South America. A session on the involvement of local people in crocodilian conservation examined the challenges of education in general, particularly on the Internet, and examined case histories from Cambodia, Bolivia, and the Philippines. This was followed by a session on trade issues, which included some advances in crocodile farming technology.

More than 40 posters were displayed, but in a break from tradition, most of the authors at the meeting were given a five-minute opportunity to address the plenary about their work. This was very successful in terms of linking the audience to particular issues and subjects before they viewed the posters. The subjects addressed in the posters were highly diverse, ranging from strictly pure science to applied science.

The final day was devoted to miscellaneous papers and reports, which again covered a diverse range of subjects: effects of

heavy metals and other pollutants, diving behavior, crocodilian red blood cell physiology, the case for an anatomical treatise on crocodilians, genetics, radio-tracking, satellite tracking, survey biases, biomechanics, integumentary sense organs, *Caiman yacare* life history, American crocodiles in Florida, reproduction of gharials, artificial foods, population modeling, and immune responses, among other topics. The day finished with reports from each of the Workshop Chairs, who had been advancing their mandates throughout the meeting.

Activities were arranged for most nights, including an "ice breaker" hosted by the National Aquarium in Baltimore and a BBQ at the Darwin Trailer Boat Club. Even an atypical thunderstorm as participants made their way to the boat club could not dampen people's spirits. A high point of the social agenda was the closing banquet, served outdoors at Crocodylus Park, on the outskirts of Darwin. Participants reveled in the "down-under" hospitality, meal and drinks, and Latin music.

The Castillo Prize for Crocodilian Conservation, a hand-made Mexican silver pitcher, was presented to Jenny Daltry in recognition of the exciting research that she has been undertaking in Cambodia and Southeast Asia. All participants were encouraged to buy raffle tickets and bid for some wonderful items that were auctioned—crocodile-skin wallets and genuine opals—to raise money for the *Tomistoma* Task Force. With additional items sold at the meeting itself, some US\$3,000 was raised.

The field trip began early the next morning, with participants departing by bus and four-wheel drive to the McKinlay River, about 120 km east of Darwin. This is the research site where a population of Australian freshwater crocodiles has been under study for over 25 years. Most people were able to go out in the boats and help



Jenny Daltry accepts the Castillo Prize for Crocodilian Conservation, presented by Harry Messel, who received the Peter Scott Award for Conservation Merit in a separate ceremony (see page 29). J. Thorbjarnarson photo.

catch freshies, and assist with processing and measurement. Of the 17 crocodiles caught, most were marked, some as long ago as 1980. Cane toads have just arrived in this area, and significant increases in mortality rates are expected in the next few years.

The meeting could not have been as great a success without the contribution of many people and organizations: the crocodile farms (Janamba, Koorana, Lagoon, and QDPI) that provided crocodile meat for the functions; Lenah Game Meats for its donation of kangaroo fillets; local industry that provided seafood (Newfishing Australia, Taroona, and Marine Harvest); Parks and Wildlife Rangers who assisted in the field trip; media liaison, Kerry Sharpe; and the volunteers who staffed the registration desk and assisted in so many ways (Peta Jones, Lesley Sullivan, Harvey Ottway, Erin O'Brien, and Pushpa Palianappan). Akira Matsuda set up a secure server for registrations. Adam Britton ensured that presentations were loaded and ready to go as scheduled. A special acknowledgement must go to Tom Dacey, for his considerable efforts in the months leading up to the meeting and during the event.

The CSG Working Meetings, held every two years, are the primary international meeting dedicated to crocodilian conservation. They have become the major forum for discussion of conservation problems, new findings, and new directions. Each meeting has its special highlights, and participants at the 17<sup>th</sup> Meeting seemed unanimous in their view that it had been one of the "best" meetings. — Tom Dacey, *Wet Tropics Management Authority, P.O. Box 2050, Cairns QLD 4870, Australia* <[tom.dacey@epa.qld.gov.au](mailto:tom.dacey@epa.qld.gov.au)> & Charlie Manolis, *Wildlife Management International, P.O. Box 530, Sanderson NT 0813, Australia* <[cmanolis@wmi.com.au](mailto:cmanolis@wmi.com.au)>.



John Lever, Gordon Grigg, and Luciano Verdade. J. Thorbjarnarson photo.

## CSG Steering Committee

MINUTES OF CSG STEERING COMMITTEE MEETING, 24 MAY 2004, DARWIN, AUSTRALIA. Present: H. Messel, P. Ross, D. Jelden, G. Webb, J. Hutton, K. Van Jaarsveldt, A. Velasco, R. Ferguson, D. Ashley, A. Woodward, Y. Takehara, A. Larriera, J. Thorbjarnarson, F. Huchzermeyer, V. Lance, R. Elsey, C.H. Koh, C. H. Giam, L. Verdade, M. Muñiz. Numerous CSG observers.

CHAIRMAN'S INTRODUCTION. Professor Messel opened the meeting at 9:00 am and welcomed Mr. H. Sakamoto of JLIA and Dr. Nicholas Pilcher, Chairman of the Marine Turtle SG as visiting observers. Special thanks were expressed to Grahame Webb and his Darwin group for organizing the 17<sup>th</sup> Meeting and the Steering Committee meeting. The Chairman confirmed his previously announced intention, after 15 years in the chair, not to seek reappointment at the expiration of his current term in November 2004. After a process of solicitation of member views on suitable candidates he would recommend to SSC was described. The chairman indicated his intention to finalize the discussion and recommend a chairman elect to begin transitional operations at this meeting.

CSG BUSINESS. A written report from the Executive Officer was presented and accepted. The report provided annual financial reports for 2003 and year to date 2004. The CSG has a current balance of \$104,438 and no outstanding obligations. Details on current account operation and balances, membership, office operations, fundraising, general operations, and the CSG website were presented. The successful

production and distribution of the proceedings of the last meeting were presented. A summary of activity with National Geographic Television – Crocodile Chronicle series was given. CSG received support totaling \$34,000 from NGS between 2000 and 2004 including fees for use of photo images. The relationship was not renewed by mutual consent after the termination of the series in December 2003. While financially rewarding, the relationship did not result in significant influence of

CSG on program content. The newsletter was produced under the guidance of the expanded editorial committee and with paid assistance for layout and assembly since December 2002.

The chairman commented on the importance of maintaining a healthy financial position and hoped that patrons would continue their support as CSG changed its leadership.

Grahame Webb introduced the concept of a review of core CSG business. Without formal corporate or NGO status, and with impending leadership change, the group needs to review its goals, function, and aspirations.

Grahame expressed his view that the minimum obligation of the CSG was to provide the IUCN, through the SSC, with expert scientific opinion and advice on the conservation of crocodilians, and to assist the IUCN to fulfill its mission with regard to crocodilians and their habitats and indicated that a workshop during the 17<sup>th</sup> Working Meeting would solicit and compile member views. The main activities of CSG are accomplished by the independent actions of members. The chairman noted the need for information derived from member research as the basis for conservation action and that the conservation of crocodilians in the wild was the core business of CSG.

**REGIONAL REPORTS.** Grahame Webb presented a short written summary of recent activity in the East Asian - Australian Oceania region (see page 18). High points included the current discussion in Australia of a proposal for safari hunting of 25 crocodiles/year in Northern Territory that faces opposition from animal rights groups. The CSG has already expressed support for the concept to the Australian Government. The situation in Cambodia was noted and deferred to discussion later in the agenda. CSG's efforts to encourage Papua New Guinea to resume crocodile surveys with support of CITES Animals Committee were successful. A letter from CSG member B. Pitu on current crocodile-human conflict problems in Solomon's was referred to the regional vice chair. Recent political instability prevented active CSG intervention.

**South Asia:** Nikhil Whitaker presented a written report on behalf of Rom Whitaker (see page 18). In India, increased conflict between people and crocodiles was a growing concern. There remains a large stock of captive crocodiles; the captive breeding program is



Alejandro Larriera addresses participants of the 17th CSG Working Meeting. J. Thorbjarnarson photo.

under-funded; and the program in Uttar Pradesh was closed. The situation of *C. porosus* in the Andamans was improved with a variety of size classes observed and reduction in previous illegal removal.

Sri Lanka continues to be the location with the most stable population of *C. palustris*, with new sites confirmed in the north. In Bangladesh, the development of a crocodile farm is approved and the farm will begin operations. Integrating this activity with crocodile conservation and the independent activities of government and academic sectors is needed. Additional information on status of crocodiles in Bhutan, Nepal, Pakistan, and Iran was presented.

**Africa:** Richard Fergusson advised that Namibia has submitted a proposal to CoP 13 to downlist *C. niloticus*. Limited utilization through trophy hunting is envisaged. With limited habitat and populations but good management capacity, this proposal will probably be OK. Zambia recently conducted surveys to support a request for a limited export quota of PAC and sport-hunted trophies. Mozambique was also rumored to be considering increasing sport hunting to 1,000 specimens, but the unresponsive nature of the Management Authority and complete lack of data cause concern for this proposal.

In Madagascar, activities focused by the CITES review of ranching programs have allowed development of a draft management plan that is now in the government approval process. At the IUCN World Parks Congress in

South Africa last year, Madagascar's president committed to increasing the percentage of land in protected areas. A letter from CSG to Madagascar requesting inclusion of wetland crocodile habitat in this action was approved. (R. Fergusson drafted for H. Messel).

Tanzania had reported results of a crocodile survey in 2003 that, in addition to the normal survey areas, addressed the crocodile status in some of the harvest areas. This was an improvement over previous surveys. Some populations have increased since the previous surveys, while others have declined.

R. Fergusson reported for the rest of Africa under separate agenda items.

**Europe:** Dietrich Jelden reported that the wild population of crocodiles in Europe remained stable (at zero!), but captive stocks in zoos and personal collections continued to grow. He recognized and thanked Mr. Kralle representing the manufacturing sector of the German industry who had provided support to CSG. The German government also provided funding to support the recent CITES Mission to Paraguay. Dietrich was now representing EU on CITES Standing Committee and presented several CITES-related issues. The development of a process to facilitate the temporary transfer of trade samples was now resolved. CITES Secretariat will submit, to the 13<sup>th</sup> CoP of CITES in October 2004, a document that had been adopted by the Standing Committee in March. CITES was adopting definitions and procedures for sustainable use based on a document adopted at the 7<sup>th</sup> Meeting of the Convention on Biological Diversity, and CSG had an opportunity to assist IUCN to support this initiative. The next CITES CoP will also discuss results of a recent workshop held in Germany that would facilitate linkage of species-based and site-based conservation and address CSG

concerns for endangered crocodilians of low commercial value.

Dietrich introduced John Caldwell of UNEP-WCMC, who proposed a revision of the Crocodile Farming and Ranching Directory. The directory could be compiled by WCMC in six months for distribution by CD-Rom and on the Internet for an estimated cost of EU 30,000. Caldwell requested support from the crocodile industry for this work.

Ralf Sommerlad presented a written report on the *Tomistoma* Task Force Project in Europe (see page 21). A registry, genetic analysis, and studbook approach to conserving captive *T. schlegelii* are proposed.

**North America:** Allan Woodward gave a brief synopsis of the continued good condition of alligator populations throughout their range and presented recent egg collection and production data. *C. acutus* in South Florida are reported to be steadily increasing. Manuel Muñiz presented an extensive written report on activity in Mexico (see previous issue of CSG News – Vol. 23, No. 1, pp. 21-24). The national survey program continued to confirm the strong status of *C. acutus* in many coastal locations and *C. moreletii* throughout its range, including some reported range extensions in the northeastern states of Mexico. These results were being compiled into

a request for the USA to downlist *C. moreletii* on the Endangered Species Act. Mexico continues to consolidate its position as a major processing center, importing 250,000 skins/year. Additional information on national and regional coordination were presented.

**Central America:** Manuel Muñiz reported on recent reports of surveys in Nicaragua and Costa Rica and interest in crocodile (caiman) farming in El Salvador. Alvaro Velasco reported continuing surveys in Honduras and in Cuba.

**South America:** Alejandro Larriera reported



Adam Britton & Charlie Manolis: a dynamic duo that kept the meeting running smoothly. R. Sommerlad photo.

that Argentina now has ranching programs in three states. Brazil has recently recognized the non-endangered status of all its crocodilian species and changed its national listings. This followed extensive work by Luciano Verdade. Venezuela recently resumed sustainable harvest of wild caimans with a quota this year of 70,000 skins. Research on *C. latirostris* in Uruguay continues by CSG member Claudio Bortiero. Discussion of Paraguay, Bolivia, and Colombia were deferred to later in the agenda.

SPECIES AND TASK FORCE REPORTS. Nikhil Whitaker presented a recent paper by R. Sharma and D. Basu detailing the apparent decline of gharial in the Chambal sanctuary in India and describing the various factors involved. A decline of approximately 40% in five years is documented. This is the direct result of people's activities, particularly illegal fishing. The Chairman expressed deep concern and indicated that CSG's role should be to encourage the Government of India to react. Unfortunately, India has been unresponsive to several recent CSG requests. After discussion it was decided to try to use the IUCN Congress resolution process to capture Indian NGO and state government support. The success of a similar strategy in regard to Chinese alligators was noted. A working group of D. Jelden, Nikhil Whitaker, Dr. Giam, and Dr. Rashid was asked to develop a draft resolution and strategy for CSG.

Bangladesh crocodiles: The development of crocodile farm in Bangladesh was reported, and some difficulty and criticism from the Dept. of Forestry and university sources was noted. A suggestion for the commercial sector to promote a national crocodile management and conservation association was made. Perran Ross asked to pursue this with the interested parties.

Chinese alligators: Mr. Ruan of the State Forestry Administration reported on Chinese government efforts to support Chinese alligator conservation and the national conservation plan. Substantial government funds were allocated to the two captive breeding centers. A trial release of three specimens was underway to test reintroduction techniques, conducted by Anhui University in conjunction with Wildlife Conservation Society (WCS). Mr. Ruan noted that the CSG's Chinese alligator fund was no longer growing and asked if the fund could be reactivated and its application to the national program discussed. John Thorbjarnarson of WCS reported the most recent results of the reintroduction trial, including the re-discovery of the third released animal that had an intermittently operating radio transmitter but was alive and well. The released specimens have therefore successfully survived their first winter hibernation period.

Cambodia: Mr. Nao Thuok, Director of Fisheries, presented an update of activities and concerns. Recent surveys report crocodiles in ten provinces, but all populations are very small and subject to illegal capture. Workshops conducted with government officials and farmers have addressed the problem, and new procedures for inventory and regulation were adopted. New legislation has been drafted and awaits approval. However, the very large number of small, unregulated farms and infrastructure limitations impede progress.

The Minister of Agriculture, Fisheries, and Forests offered to host a CSG meeting in Cambodia. After discussion, the Chair expressed thanks and appreciation but suggested that, in view of the need for rapid consideration of Cambodia's crocodile management, a regional meeting could be held more quickly.

Jenny Daltry of FFI expanded the report with details on surveys locating 23 sites and an estimate of no more than 162-200 individuals and only three breeding sites. Threats from



Gu Changming, Ruan Shangdong, & Grahame Webb.  
J. Thorbjarnarson photo.

illegal collection are intense—for example, 61 cases documented in last three years and two last month. National exports from farms total many thousands, so wild animals are only a small proportion, but the effect on the wild population is very severe. Good efforts by the government include improved enforcement, external support, and community programs to promote cultural support of crocodile protection. But these actions will be futile if illegal removal continues. Wild collection is driven by demand and high prices: \$20 for a hatchling and \$1,000 for an adult, compared to local salaries (\$14/month).

Professor Messel expressed extreme concern and congratulated efforts of those involved. He suggested that a regional meeting in Cambodia be a priority to draw political attention to the issue. These efforts linked to broader question of CITES compliance and illegal trade from Cambodia under CITES review, and will be considered by CITES Standing Committee and CoP. Dietrich Jelden was asked to chair discussions at this meeting and prepare a draft letter to be sent to CITES secretariat.

John Thorbjarnarson reported on the activities of the CSG Siamensis Working Group and noted the participation of the IUCN–GEF Wetlands Program. This program has targeted four flagship species for Asian wetlands, of which *C. siamensis* is one. Alvin Lopez, coordinator of the program, was present, as well as representatives from Laos, Cambodia, and Thailand. TRAFFIC - SE Asia is preparing a report on crocodile farming results, expected soon. Dr. Giam, who sits on the CITES Animals Committee, reported that CITES also was reviewing trade issues in Cambodia and that ASEAN might also be a vehicle for effective intervention at the regional level. The issue and avenues for solution therefore extend beyond CSG.

On 27 May, a workshop involving CSG members and representatives from Cambodia, Laos, Indonesia, the IUCN Mekong Wetlands Program, Flora and Fauna International, and Wildlife Conservation Society was conducted. The workshop identified key factors threatening *C. siamensis* throughout its range and recommended a range state workshop to further assess threats and develop a coordinated regional strategy. The group recommended integration of this proposed workshop with the IUCN-GEF

program and the suggested regional meeting in Cambodia, in order to provide guidance on how the issues identified could be brought to the attention of the Cambodian government, neighboring range states, and the CITES secretariat.

Tomistoma Task Force (TTF): Grahame



Boyd Simpson presenting an overview of recent surveys for Siamese crocodiles in Cambodia. J. Thorbjarnarson photo.

Webb gave an update on the activities of the TTF, which was formed in 2002 at the Gainesville meeting to coordinate individuals interested in this species. TTF has generated a strategy and work plan, developed a website, and started fund-raising. Efforts of Akira Matsuda (website), Ralf Sommerlad, Bruce Shwedick, and Scott Pfaff (fundraising) were applauded. TTF also has received useful funding support from AZA and member zoos and from Terry Cullen. At this stage Grahame suggested that the species task force concept be examined and possibly expanded to be a task force addressing needs of all the endangered crocodilian species. The Chair thanked the supporters of TTF but noted that piecemeal funding was inefficient and that a coordinated and coherent fund-raising strategy was needed. A written report on TTF activity in Europe by Ralf Sommerlad again was acknowledged (see page 21).

Papua New Guinea: After an introduction by Mr. Takehara, Godfrid Solmu of the PNG Dept. of Environment summarized recent actions of

the department in PNG. These included surveys in 2003 and 2004 that confirm the stable status of representative harvested crocodile populations in PNG. CSG efforts in encouraging the resumption of surveys were gratefully acknowledged. Current population levels and wild skin exports were at the low end of the recent range, which is thought to be due to recent high water levels, and the department will monitor for the next six months to confirm. David Wilken, of Mainland Holdings Crocodile Farm, reported that Mr. Paul Stobbs, the previous general manager of Mainland Holdings, had left the company and Mr. McCardle was the next general manager. Mr. McCardle was unable to attend the meeting due to a conflict in his schedule and commitments in PNG, but sent his best wishes and assurances that he intended to continue the close collaboration between CSG and Mainland. Professor Messel expressed the sincere thanks of CSG for the many years of support from Mainland.

Colombia: Alvaro Velasco presented a report on the recent site visit to Colombia, conducted 1-5 March 2004 by A. Larriera, A. Velasco, G. Webb, B. Ortiz, and M. Rodriguez. The trip was arranged in conjunction with the Colombian Ministry of Environment, Housing, and Land Development and caiman producer organizations AZOOCOL and Biodiversa, who also financed the visit. The report provides a detailed itinerary, observations, and recommendations from CSG to Colombia and has been submitted to the Colombian government and producer associations; their response is awaited. Alejandro Larriera indicated that the visit team was very pleased with the outcome, felt CSG had a much-improved understanding of the situation in Colombia, and had laid the foundation for an enduring, mutually beneficial relationship. Professor Messel congratulated the team on their excellent work and diplomatic and technical skills that had initiated this contact and brought it to such a successful point.

The meeting broke for lunch, 12:30–1:30 pm.

Bolivia: Alejandro Larriera introduced Alfonso Llobet, who described recent problems with the management of the yacaré harvest. Limited management capacity, unreliability of surveys, allocation of harvest quotas, and poor



Grahame Webb, Akira Matsuda, Dietrich Jelden, Jon Hutton, Alejandro Larriera, and Alan (Woody) Woodward. J. Thorbjarnarson photo.

enforcement were noted. Alphonso had prepared a report with recommendations, and the new Bolivian government was more responsive. However, Alejandro noted that while CSG provided extensive advice to previous Bolivian management authorities, harvest management difficulties persist. The problem is similar to that in Paraguay and continued CSG intervention was requested.

Paraguay: The current status of developments following the Paraguay trade suspension was described. Marcos Couthino has been assisting CITES and advising Paraguay, participating in the CITES Paraguay review in March 2004 and a second recent trip. The current issue concerns a stockpile of about 30,000 caiman skins harvested legally during the previous harvest season but now stranded by the trade ban. After discussion, it was agreed that CSG had no objection in principle to releasing the stockpile. CSG has managed such dispositions many times before. However, Paraguay should be required to make some concrete demonstration of improved management capacity, as required by the CITES Standing Committee. Inventory, tagging, permitting, and orderly export of the stockpile could be a valuable demonstration of Paraguay's renewed commitment to effective CITES implementation. Alejandro and Alvaro will draft a letter to the Paraguay government offering our assistance.

Crocodile - Human Conflict Task Force: Richard Fergusson reported on his activities in Africa. The task force has been relatively inactive, although Richard is developing guidelines for Management Authorities and proposes a database, public awareness program, and additional research to examine determinants of conflict situations. At the IUCN World Parks

Congress, a proposal to integrate Human - Animal conflict issues within IUCN was approved and the SSC Commission on Economics and Social Policy is establishing a global network on the topic. Concerns about excessive bureaucracy were expressed. Completion and distribution of the guidelines and reactivation of the Task Force was recommended.

**CITES ISSUES.** Professor Messel noted that the only reason to discuss CITES and trade issues is their link to conservation. Dietrich Jelden and Don Ashley then advised the group as follows:

Personal effects exemption: Recent estimates are that 30% of sales of crocodile items are directly to "tourists" who then move across borders. Adoption of the CITES personal exemption is therefore a significant assistance to sustainable trade. At the last CoP, CITES called on parties to implement this exemption for a limited number of well-regulated species, including crocodilians. A process of harmonization of regulations in major importing nations (USA, EU, Japan) is under way, but not complete. Two proposals for the next CoP will introduce additional species for inclusion under the exemption (sea horses, corals, and giant clams) and propose that all parties apply the exemption or advise the secretariat that they are not doing so (the reverse of the present process). CSG members should support these initiatives at the CITES CoP in Bangkok in October.

Infractions and enforcement: CITES parties suspended the report of infractions due to concerns that this was unduly punitive and embarrassing to parties; however, some mechanisms to track and correct "inconsistencies" are still required. Extra-CITES mechanisms, such the IACTS report, address this need.

Live trade: In the last four years approximately 160,000 live *C. siamensis* were exported from Thailand and Cambodia to China, many via Vietnam. Noting continuing problems with illegal transfer of wild crocodiles to farms in Cambodia, the meeting called on importing states to assist range state exporters to improve internal controls and capture conservation values from this very extensive and valuable trade.

Movement of trade samples: A short report on the development of this matter in CITES was submitted. After CITES approved the development of a mechanism for this purpose, various technical and legal issues have impeded implementation. CITES Standing Committee was recommending that an ATA carnet and CITES permit could serve this purpose, and a procedure was proposed. CSG members should ensure their national delegations to CITES are aware of and supportive of these measures. CSG could consider appropriate intervention to advise the CITES Secretariat and Parties of our support for these measures.

CITES compliance issues: Ms. Tomme Young from the IUCN Environmental Law Center gave a brief overview of the complexities of international law regarding enforcing compliance with treaties like CITES. CITES is proposing a "Compliance Committee," but the structure and activity of this remains undefined. To support this initiative, IUCN is preparing an information paper for CoP that will include case studies and "best practice" examples of successful compliance improvement strategies. Crocodiles may provide valuable examples for this report (e.g., universal tagging of crocodile skins). Ms. Young will attend the CSG meeting to obtain information.

Review of ranching for the Animals Committee: The development of this project and its current implementation by CSG—with partial funding of \$11,000 from the Swiss government—was described. A summary of results to date was presented by Richard Fergusson (Africa) and Alejandro Larriera (Latin America). The initial report indicates that incomplete compliance with the requirements of the ranching resolution (e.g., monitoring, conservation benefit, and reporting) is widespread. However, compliance is good in some countries, demonstrating that this can be achieved and in no case was there any indication that wild populations were declining as a result of ranching. It appears that the provisions of the ranching resolution were overly cautious and impede realistic compliance, particularly in less-developed nations. Simplification of requirements to the minimum necessary to improve compliance and ensure non-detriment/conser-vation benefit as required by CITES is needed. Discussion of particular situations included movement of eggs from Mozambique to South Africa, developing

ranching in Brazil and Colombia, and Venezuela's production of 12,000 hatchlings annually for the pet trade. CSG will report the results of the analysis forthrightly, indicating where the problems lie. The Chair noted that there may be failures in compliance but there is not a failure of conservation.

Ranching program of Ecuador: As part of his presentation on ranching in South America, Alejandro Larriera described recent events regarding Ecuador. A request from the Ecuador Authority in 2002 to increase their export quota from zero to 15, to allow the export of live specimens collected in the ranching program, was approved by CSG and CITES. However, the export had still not been accomplished. CITES recently received a request for further expansion of the quota to additional 50 live specimens and asked for CSG's opinion. After extended discussion of the history and circumstances of the effective failure of ranching in Ecuador due to unavoidable and inherent infrastructure and capacity deficiencies, the chairman ruled that CSG would not approve additional export quotas in the absence of any reports concerning the farms operation, numbers of animals, or structure of the management program. A minority view suggested that further export of specimens already held would have no conservation effect, but the chair's decision was widely supported and after further discussion was confirmed.

Economic study of crocodilian trade: Kevin van Jaarsveldt brought forward concerns previously expressed about the content and wording of the first report from this project. Confusion about the definitive version of the report (draft Oct. 2001 or final Oct. 2002) was resolved and the improvements in the final draft noted. The document is now widely disseminated on TRAFFIC, Resource Africa, and CSG websites. Concern was expressed about the origin, funding, and authority for Phase II of the project. Professor Messel clarified that due to the concerns about the first report, Phase II was deliberately structured as project of TRAFFIC International funded directly by Florida and Louisiana industry sources to TRAFFIC with no direct CSG oversight to keep it at "arms length." However, CSG would receive and review the report and have opportunity to comment and amend its content. The draft Phase II report was then submitted to the Steering Committee for review.



CSG meeting participants pull an Australian "freshie" (*C. johnsoni*) out of a net or "billabong" during the McKinlay River field trip. J. Thorbjarnarson photo.

Proposals to CITES CoP regarding source codes and modes of production: The USA was submitting a proposal to change the definitions of "R" (Ranched) and "W" (Wild), apparently to rectify inconsistencies in source coding on US export permits for alligators derived from mixed stocks of ranched and captive-bred specimens. Simultaneously, CITES is proposing a general review of the modes of production of specimens and review of simplification of source codes. CSG will recommend that the USA defer its proposal until a general review and more refined general definitions of production and source codes for CITES species has been conducted.

Cuban proposal to downlist its *C. acutus* population for ranching: This proposal received detailed input from CSG since its inception. The proposal has a strong biological basis with good data on crocodile populations, and the proposed activities are moderate and well-designed. The first submitted draft was circulated to all Steering Committee members, and the final draft was reviewed by seven CSG members. All comments received were supportive, and minor changes for improvement were directed to the Cuban Authority. Unfortunately the Cuban representatives failed to obtain visas and were unable to attend the meeting at the last minute. Recent communications indicate the suggestions

are all incorporated into the final submission and on this basis CSG will give its full support to the proposal. Any final amendments can be introduced during discussion at CoP.

**VETERINARY ISSUES.** Val Lance introduced Dr. Steven Salisbury, who described in detail a proposal to establish an International Committee on Crocodilian Anatomical Literature and prepare an annotated atlas of crocodilian anatomy. He requested CSG approval in

principle and cooperation of CSG members for this initiative. The Chair indicated that CSG supported this useful action that would greatly assist physiological and paleontological studies, and asked Val Lance to draft a suitable letter to Dr. Salisbury.

Fritz Huchzermeyer presented short information items regarding the veterinary group's deliberations on humane slaughter of crocodilians and on the movement of crocodilians as a vector of crocodilian disease. These were noted and the veterinary group was encouraged to develop documentation on these

matters for the group (see page 26).

**OTHER BUSINESS.** Synergy with SSC Sustainable Use Group: Jon Hutton, Chair of the SU group, described his group and indicated that CSG members could expect to interact with the SU group and its members. SUSG had reorganized its 500 members into subgroups that cross-cut taxon interests. Jon requested further detailed coordination between SUSG and CSG through the Executive Officer and proposed that SUSG members could receive the CSG Newsletter. Some members of CSG would be invited to be members of SUSG's global membership class.

Jon also advised that CITES was considering adopting definitions of sustainable use based upon the definitions used in the Convention on Biological Diversity (CBD), which would bring the two conventions into harmony regarding SU and strengthen SU within CITES. CSG members were requested to support this move at CITES CoP.

IUCN Red List: Grahame Webb referred to a recent publication focusing on difficulties applying Red List criteria to long-lived and widespread species. Discussion followed on the need to keep Red Listing of crocodilians relevant and practical and the different approaches applied by different groups. Further attention to this matter will be required as CSG moves to re-evaluate crocodilian Red Listing that is mandated by IUCN.

Venue of the next meeting: The proposal from Cambodia had been referred back to Cambodia with the suggestion that a Regional Meeting would address their concerns in a more timely manner. Mr. Luc Fugeiro of Ferme de

Cocodriles in Peirrelatte, France, tentatively proposed that the next meeting be held in southern France. After some discussion on the benefits of this venue for close contact to trade and manufacturing interests and its convenience, safety, and low cost, the Vice Chair for Europe was requested to pursue the matter and generate a detailed proposal from the hosts on location, facilities costs, funding, etc. for consideration and approval by CSG.

Chairman of the CSG: Following upon Professor Messel's announcement that he would not accept re-appointment to the Chair in November 2004, being eager to pursue personal activities, the group was requested to advise him on a suitable candidate whom the SSC Chair would recommend for appointment in November. Two qualified and willing candidates were identified: Grahame Webb and Perran Ross. The Steering Committee had conducted an internal discussion and a confidential indication of preferences that had been transferred to the Chairman. The meeting questioned Dr. Ross and Dr. Webb separately and then after discussion agreed that Professor Messel would recommend Grahame Webb to SSC.

There being no further business, the meeting



Harry Messel providing post-presentation commentary.  
J. Thorbjarnarson photo

closed at 5:45 pm

**FOLLOW-UP MEETING: 28 MAY 2004.** Present: H. Messel, P. Ross, D. Jelden, A. Larriera, G. Webb, L. Verdade, D. Ashley, F. Huchzermeyer, J. Hutton, A. Velasco, R. Elsey, J. Thorbjarnarson, R. Fergusson, V. Lance, A. Woodward.

Dispositions of the following Action Items were reported; text of letters and responses follows:

- (1) A draft letter to the President of Madagascar requesting inclusion of wetland crocodile habitat in protected areas expansion proposed at World Parks Congress was approved. See below.
- (2) CSG members will be encouraged to support initiatives to facilitate transfer of trade samples through their national delegations to the CITES CoP.
- (3) A working group on the Chambal gharial crisis prepared a draft resolution and recommended a strategy to insert this resolution into IUCN World Conservation Congress in November, with the assistance of Indian IUCN members. See page 15.
- (4) A draft letter of reply to the Minister of Agriculture, Fisheries, and Forestry, Cambodia, recommending a regional meeting and detailed range state workshop to address *C. siamensis* issues was approved. Outputs and recommendations of the *C. siamensis* working group conducted during the meeting were integrated into this response. See page 15.
- (5) Don Ashley and Perran Ross were asked to communicate with CITES Management Authority USA regarding proposals on changes to product listing codes and production methods and coding. See page 16.
- (6) Perran Ross was charged with advising the CITES Secretariat of CSG's decision not to approve additional export quotas of live, ranched specimens of *Melanosuchus niger* from Ecuador.
- (7) A draft report of Economic Study of the Crocodilian Trade, Phase II by James McGregor and TRAFFIC was received and submitted for review to H. Messel, D. Jelden, G. Webb, K. Van Jaarsveldt, J. Hutton, and P. Ross. Comments are to be sent directly back to Steve Broad.
- (8) The Executive Officer was charged with advising the CITES Secretariat of the CSG positive reviews and approval for the Cuban proposal to downlist their population of *C. acutus* for ranching.
- (9) Val Lance was charged with drafting a letter to Dr. Salisbury endorsing preparation of the Anatomical Guide to crocodilians.

(10) In new business, Dr. Jayantha Jayawardene of the Biodiversity and Elephant Trust, Sri Lanka, requested CSG's support for an approach to the government of Sri Lanka to activate crocodilian conservation with CSG's assistance. Dr. Jayawardene agreed to provide CSG with a draft for the chairman's review and signature. See page 17.

After thanks to members for their participation and congratulations again to Dr. Webb and his team for an excellent 17<sup>th</sup> Working Meeting, the Chairman closed the meeting.

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LETTER RE: MADAGASCAR PROTECTED AREAS:

M. Marc Ravalomanana  
President of the Republic of Madagascar  
BP 955 Antananarivo, Madagascar

Mr. President,

The Crocodile Specialist Group of the IUCN-SSC respectfully introduces itself to you and wholeheartedly welcomes your commitment made at the 5<sup>th</sup> World Parks Congress held in Durban, South Africa in 2003 to increase the area of protected habitats in Madagascar.

The Crocodile Specialist Group has on several occasions assisted the Ministry of Environment, Water, and Forests and the stakeholders in Madagascar by providing technical assistance and suggestions on crocodile management policy. Members of the Group have most recently assisted in drafting a formal Policy and Management Plan for crocodiles in Madagascar. The plan provides for the conservation and sustainable use of the species while appropriately responding to the serious problem of conflict between people and crocodiles to safeguard peoples welfare and livelihood.

Your commitment to significantly increase the area of land that is protected in national parks and protected areas will greatly improve the status of many species of Madagascar's unique flora and fauna and contribute to human welfare in surrounding areas. We would like to respectfully suggest that the proposed park expansions include a significant amount of freshwater ecosystem (rivers, lakes, swamps). Most of the protected areas in Madagascar do not currently include significant amounts of these habitat. Some reserves have no wetland,

while those that do, use the rivers as boundaries-excluding much of the most valuable watershed area. The inclusion of wetland habitats in protected areas would ensure the conservation of entire wetland ecosystems with their many unique species, including the Nile crocodile. This would preserve the potential economic value of crocodiles, separate crocodiles from the problems they can cause to people, provide a visible flagship species for the preservation of Madagascar's wetlands and support fisheries and freshwater resources. The CSG would be pleased to assist your personnel in identifying suitable areas.

Sincerely yours,

Professor H. Messel

cc: Minister of the Environment, Water & Forest, BP 243 Antanananarivo, Madagascar

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**RESOLUTION ON: DECLINE OF THE GHARIAL (*GAVIALIS GANGETICUS*) IN THE CHAMBAL RIVER BASIN:**

RECALLING that the status of the gharial in the wild has long been of concern to the Government of India;

AWARE that the gharial was classified as Endangered in the IUCN Red List of Threatened Animals 2003, and has been given high priority for conservation action by the IUCN Species Survival Commission (SSC) Crocodile Specialist Group;

ACKNOWLEDGING the success of actions initiated by the Government of India to:

- (a) give the gharial highest protection--Schedule 1—under the Wildlife Protection Act, 1972
- (b) rehabilitate the gharial through the Government of India/FAO/UNDP Project with the rehabilitation of several thousand gharial into viable habitat
- (c) protect India's crocodilians in nature with the establishment of 13 sanctuaries totaling over 8,000 square kilometers
- (d) collect gharial eggs from nature and rear the hatchlings to a size appropriate for re-introduction in three rehabilitation centers in Uttar Pradesh

CONCERNED that, in addition to national concerns about the survival of wild gharial in the Chambal, a very high level of international concern was expressed at the meeting of the IUCN/SSC Crocodile Specialist Group held in Darwin, Australia in May 2004, about the need for urgent action to ensure this unique crocodilian does not become locally extinct, largely due to the detrimental effects of fishing, sand mining, and agriculture.

The 3<sup>rd</sup> World Conservation Congress in Bangkok, Thailand, in November 2004:

1. ENCOURAGES Government of India to continue its efforts to save the gharial in the Chambal River and elsewhere;
  2. URGES all IUCN members to support the Government of India in their efforts to:
    - (a) maintain a strong research presence dedicated to the species
    - (b) manage biodiversity within the tri-state Chambal Sanctuary, of which the gharial is a component
    - (c) take such actions that are necessary to ameliorate current threats to the existing Chambal gharial, with the primary aim of improving the status of this population
    - (d) undertake measures to reverse population declines of gharial in the Chambal
  3. REQUESTS the Species Survival Commission, within available resources, to offer assistance to India, through the IUCN/SSC Crocodile Specialist Group, in convening a technical workshop to implement the foregoing actions. \*\* See page 19 for more on the gharial crisis in the Chambal.
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**LETTER RE: CAMBODIAN ISSUES AND MEETING:**

H.E. Chan Sarun  
Minister of Agriculture, Forestry and Fisheries  
#200 Preah Norodom Blvd.  
Sankat Tonle Bassac, Khan Chamcar Morn  
Phnom Penh, Cambodia

Re: Conservation of Crocodiles in Cambodia

Honorable Minister,

The Crocodile Specialist Group of IUCN-SSC views Cambodia as the last stronghold of the Siamese Crocodile. We have received with great approval recent reports of new discoveries of crocodile populations and the efforts of your Ministry to address regulation of crocodile

farming and trade. At our 17<sup>th</sup> Working Meeting held in Darwin, Australia, May 24-30, 2004 we heard from 10 Cambodians from government departments and private sector, as well as two international reports that indicate that the Royal Government Cambodia is committed to the conservation of wild crocodiles. We congratulate the progress that has been made in the country that will indeed contribute to the survival of this critically endangered species.

We were also honored to receive your invitation for CSG to consider holding a meeting in Cambodia hosted by the Cambodian Government. During our meeting a workshop was conducted among Cambodian and other range state representatives to identify issues and concerns and provide guidance on how these issues could be brought to the attention the Government of Cambodia, neighboring range states and appropriate international bodies such as the CITES Secretariat. Considering the recommendations of this workshop and the urgency of the issue, we would like to respond to your kind invitation by proposing that a special range state meeting be held as soon as possible. This meeting, held at the regional level, would be more quickly organized and could provide valuable guidance for immediate activity in the region and could be the basis of a report on progress to a future CSG Working Meeting. In order to guarantee the participation of the other states and the undertaking of fruitful discussions on the regional issue of trade in Siamese crocodiles we would also suggest that the meeting be organized in conjunction with the CITES Secretariat.

Integration of this regional meeting with broader efforts undertaken in the context of the IUCN Mekong Delta initiative, and ASEAN would enhance its value.

We very much appreciate your efforts to conserve and manage wild crocodiles in Cambodia and look forward to working cooperatively with your Ministry and other Cambodian institutions and representatives to achieve this important conservation goal.

Sincerely yours,

Professor Harry Messel, Chairman  
cc: CITES Secretariat, IUCN Mekong Delta  
initiative; Dr. C.H. Giam



DRAFT LETTER TO CITES MANAGEMENT AUTHORITY OF THE USA (TO THE ATTENTION OF KENNETH STANSELL):

Dear Mr. Stansell,

With this note I would like to take the opportunity to inform you on recent discussions which the IUCN Crocodile Specialist Group (CSG) had during the last meeting of its Steering Committee (SC) on 24 May in Darwin, Australia regarding a US proposal submitted for the 13<sup>th</sup> CITES Conference of the Parties (CoP), 2-14 October 2004, to amend CITES Resolution Conf. 12.3 with regard to the use of the source code "R" for "Ranched" specimens.

The CSG Steering Committee (SC) took note of the intention of the US to find the support from the CITES member states at the 13<sup>th</sup> CITES CoP to narrow the scope for the use of the source code "R" on CITES permits. However, the CSG SC expressed serious concern on this US initiative because it would also have serious implications on crocodilian multi-focal management programs (including wild harvests, farming, and ranching) in many CITES contracting parties. Some of these parties' ranching components had even been established long before CITES resolution Conf. 3.15 on "Ranching" had been adopted in 1981 at the 3<sup>rd</sup> Conference of the Parties such as for example in Papua New Guinea for the New Guinea and the saltwater crocodile native to this country.

In addition, the source code "R" on CITES permits, as currently defined under CITES Res. Conf 12.3, should also be regarded as an indicator for economic incentives to promote the sustainable use of well-managed wild crocodilian populations and therefore rather be maintained in a wider scope than narrow. It would from the CSG SC view be too premature to narrow the scope now.

Furthermore, the CSG SC also acknowledged and commended the US initiative for the forthcoming CITES conference in Bangkok to advance the important issue of more clearly defining the many different harvest production systems which have evolved since CITES came into force in 1975. This is an important far-reaching initiative trying to solve a long-pending issue under the CITES Animals Committee. The CSG SC concluded that the issue of revisiting and streamlining the use and applicability of the source code "R" should preferably and better be dealt with under this US initiative instead of

under a single proposal for amending the CITES permit and certificate resolution Conf 12.3.

In hoping that these comments might be useful, I remain as ever,

Yours sincerely,

Prof. Harry Messel  
cc: CITES Secretariat

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LETTER TO PRESIDENT OF SRI LANKA:

8 June 2004

Her Excellency Chandrika Kumaratunga  
President of Sri Lanka  
Colombo 1, Sri Lanka

Your Excellency,

I am writing to you to address the important topic of crocodile management and conservation in Sri Lanka.

*The role of crocodiles in the environment:*  
Decades of research on the 24 extant species of crocodiles and their cousins, the alligators, caimans, and gharials, have shown that these species play an important role in wetland ecosystems. In many situations they are good indicators of the condition of the environment. In Florida, USA, for example, the status of alligators is being used to indicate the success of a US\$25 billion program to rehabilitate the Everglades wetland. Elsewhere, the deterioration of catches of the most highly-valued species in commercial fisheries has been linked to the disappearance of crocodiles, while in Africa, in regions with highly seasonal rainfall, the survival of amphibians, fish, and some reptiles is commonly linked to the ability of crocodiles to dig "hibernation" holes deep into dry river banks.

*The present situation in Sri Lanka:* As you are aware, Sri Lanka has two of the 23 species of crocodile that exist in the world today – the mugger or marsh crocodile (*Crocodylus palustris* Lesson 1831) and the saltwater or estuarine crocodile (*Crocodylus porosus* Schneider 1801). However, it seems that Sri Lanka is one of the few countries which has done little in terms of researching the biology and ecology of its crocodiles with a view to managing them.

Though the mugger is internationally threatened, there are a few thousand in the island today. However, the saltwater species, widely

prevalent in many countries, is greatly threatened in Sri Lanka.

*What is the CSG?* The Crocodile Specialist Group (CSG), which is part of the Species Survival Commission of IUCN – The World Conservation Union, is a world-wide volunteer network of more than 300 specialists with skills ranging from crocodile biology and management through human-crocodile conflict and rural education to sustainable harvesting, commercial production, and marketing. Working with individuals, communities, countries, and international organizations, the CSG has over a period of more than 25 years successfully assisted in the resolution of crocodile conservation and management issues in more than 30 countries around the world. The group does not have access to significant funding, but with its extensive network of volunteers manages to invest very significant resources in crocodile conservation every year. The CSG has in the past contributed to national crocodile management through a range of services including assessment, information dissemination, training, research, mapping, planning, workshop facilitation, conflict resolution, monitoring, and evaluation.

*Offer to help Sri Lanka:* Given the situation facing crocodile conservation within Sri Lanka, we would like to offer to your Government such assistance as the Crocodile Specialist Group may be in a position to provide. This might include some help with national assessment and a crocodile biodiversity strategy if this is considered appropriate.

We await your advices.

Yours faithfully,

Professor Harry Messel, Chairman



Ah, the joys of fieldwork! A truck stuck in the muck during the McKinlay River field trip gets a push from CSG Meeting participants. J. Thorbjarnarson photo.

IUCN/SSC Crocodile Specialist Group

## **Eastern Asia, Australia, and Oceania**

AUSTRALIA: Management proceeding in all states; Status of Crocodiles appears secure; NT Safari Hunting Issue still under consideration.

BRUNEI: No information.

CAMBODIA: FFI and WCS are both working in Cambodia and representatives from Government of Cambodia will report separately. There are three CITES issues of significance: (a) the link between villages and large commercial farms; (b) claims that wild crocodiles continue to be purchased by some village farms; and (c) trade with China may sometimes be occurring without CITES permits. Cambodia situation to be advanced in a workshop.

CHINA: Trial reintroduction in Anhui to be reported separately. Update on China program.

INDONESIA: LIPI surveys in Papua Province (formerly Irian Jaya), and results consistent with sustainability of uses. *Tomistoma* Task Force so far unsuccessful in attracting funding for Kalimantan surveys or resurvey of Merang River area in Sumatra.

LAOS PDR: WCS has latest information and will report separately.

MALAYSIA: Increasing trends in *C. porosus* in Sabah to be reported separately. General status in Sarawak to be reported. No further surveys in Peninsula Malaysia.

MYANMAR: WCS has latest information.

PALAU: Peter Brazaits has been working there.

PAPUA NEW GUINEA: Surveys undertaken and results consistent with uses being sustainable.

PHILIPPINES: Reported separately. See page 23.

SINGAPORE: Ongoing trade, but wild population essentially extinct.

SOLOMON ISLANDS: Concern about increasing

numbers of *C. porosus*; may join CITES soon.

THAILAND: Three species essentially extinct in the wild. Reintroduction program for *C. siamensis* is planned; will be reported separately.

VANUATU: No further information on status.

VIETNAM: Wild crocodiles probably extinct. Reintroduction in one national park.

— Grahame Webb, *Wildlife Management International Pty Ltd, P.O. Box 530, Sanderson NT 0813, Australia <gwebb@wmi.com.au>*.

## **South Asia**

INDIA: A brief sketch of crocodile conservation in India: In the mid 1970s, two initiatives for saving the gharial, saltwater crocodile, and mugger were developed. One was the Government of India (GoI)/FAO/UNDP Crocodile Conservation Project that covered all crocodilian states in India. The other was a private trust, the Madras Crocodile Bank. Since the beginning of the GoI/FAO/UNDP project more than 25 years ago, over 9,000 of the three species have been reared, mainly from eggs collected in the wild, and released at over 30 sites in India. 13 sanctuaries totaling over 8,000 sq km were created for crocodile conservation.

Status and views on permission for commercial farming/utilization remain the same: The GoI failed to satisfy the requirements they agreed to (via trial commercial farming) when they accepted funds from FAO in the 1970s. The project was to include research, training, and involvement of local people to protect their interests and to include them in village-level commercial croc farming and ranching.

Status of gharial; closing of rehab. center in Uttar Pradesh: 50 % decline in the Chambal River, to approx. 600 individuals. Katerniaghata Sanctuary in Uttar Pradesh has the second-largest wild population (100 individuals), but this population is facing the threat of extinction due to habitat pressure and inadequate recruitment. Government support for the rehabilitation center in Uttar Pradesh has ended; restocking therefore has ceased to occur. There is major concern for the project to be revamped and reinstated, as this could determine the future of gharial in India. While funding for

rehabilitation centers have ceased, funding continues for managing sanctuaries and national parks, of which the gharial are also inhabitants. However, there is a need for studies to determine the carrying capacity of the Chambal River. For more on the status of gharial in the Chambal, see next page.

Excess captive management of mugger crocs in Indian zoos: There are nearly 10,000 muggers in captivity at the Madras Crocodile Bank and State Forest Department facilities. High costs of feeding and high densities are causing problems. There is a largely inadequate outflow of crocs from captive facilities, mostly in the form of the transfer of a few individuals to a zoo. There is little scope for reintroduction, particularly with the mugger crocodile.

Human / crocodile conflict is becoming increasingly serious in India. People and livestock being killed by mugger crocodiles in the states of Orissa, Gujarat, Kerala, and Rajasthan. Saltwater crocodiles in Bhitarkanika kill at least one person per year. Many of the attacks occur on huge dams, making capture difficult. Perhaps a Crocodile Attack Task Force could be established. This could be a network of zoos and organizations throughout the country. When an attack occurs, the closest entity could respond to the incident and obtain information from local people on times and locations of attacks. The task force could then work together to devise site-specific traps.

Other news: All class sizes of salties in the Andaman and Nicobar Islands are being seen; no more poaching by Thai. Crocodile habitat in Orissa is threatened by shrimp ranching.

**BANGLADESH:** Permission acquired for commercial farming of salties (originating from Sarawak). Muggers were transferred from Madras Crocodile Bank to Bangladesh for a captive breeding program ultimately geared towards re-introduction of progeny.

**SRI LANKA:** Still has the most stable mugger populations in West Asia.

**NEPAL:** Small isolated populations in Karnali, Babai, and Narayani River systems. Estimated population in the wild in 1999 was 105 individuals, distributed in seven rivers. Forty individuals were reported in Royal Chitwan

National Park, a similar population in Bardia National Park, and no reports for several years from the Koshi River. Egg collection and the rear-and-release program continue. Plans are underway for a large-scale tourism/conservation program.

**PAKISTAN:** Today, approx. 100 mugger crocs reside in Manghopir, which is probably one of the last refuges of the Pakistani muggers.

**BHUTAN:** Surveys at the Indian border are still needed. Received a male gharial from Nepal for captive facility (two females residing there). While Manas National Park used to have reports of gharials, it seems that both muggers and gharial in Bhutan are more or less extinct.

**IRAN:** Surveys are underway. Muggers have been requested from the Madras Crocodile Bank, for release and captive breeding program.

— Rom Whitaker, *presented by Nikhil Whitaker.  
P.O. Box 21, Chengalpattu, India 603001  
<draco@vsnl.com>*

## **Gharial Crisis in India's Chambal River Basin**

**GOVERNMENT SUPPORT:** Three state governments involved with the Chambal River (Rajasthan, Uttar Pradesh, and Madhya Pradesh) have been receiving government support for managing the sanctuary, but support for the in-situ rehabilitation program in Uttar Pradesh recently was terminated. However, there is surplus captive stock in Uttar Pradesh and Orissa. The Government of India has not taken into account suggestions made at the Gharial PHVA & the CSG Regional Meeting in Gwalior.

Despite this situation, we must recognize efforts by the states and the Center to rehabilitate the gharial (*Gavialis gangeticus*) population, and applaud the significant achievements of crocodile conservation started in the mid 1970s.

**SURVEY RESULTS:** Surveys conducted by the Madhya Pradesh Forestry Dept. and Jiwaji Univ. found no more than 600 gharial in the sanctuary, indicating a reductive trend that began in 1995.

**ISSUES:** (1) Socio-economic aspects of sand mining at select points on the Chambal River

and their impacts on gharial conservation need to be studied; (2) Farming, fishing, and plans for dams on the Chambal; (3) Reintroduction project was terminated; research on carrying capacity is now warranted; and (4) Integration of a croc program into the goals of local and regional institutions.

**RECOMMENDATIONS:** (1) Control pollution and implement measures for soil conservation, tree planting, and rainwater collection; (2) Revitalize the gharial breeding/rearing/release program that was terminated six years ago; (3) Start a pilot project on sustainable use of the mugger croc. for riverside stakeholders; (4) Assist fishermen—key players in this scenario—with their problems, including fish depletion; (5) Involve the various agencies interested in the conservation of all the river's species, but be careful to avoid conflicting approaches; (6) Involve local NGOs in a biodiversity and river wealth education program; (7) Identify other places suitable for reintroduction of the gharial and expand the project to include these habitats; and (8) Find funding to put a small, competent field team to work on surveying and identifying specific problems facing the gharial and its habitat. Based on their findings, a management plan can be developed and funding located to help the relevant states take action to ensure survival of the gharial. Because some funding has come through, this recommendation currently is being pursued: in collaboration with Uttar Pradesh and Madhya Pradesh, the Madras Crocodile Bank soon will be starting to conduct surveys.

**DEVELOPMENT OF A GHARIAL TASK FORCE:** Members would include those involved in working with the species in different capacities: surveys, captive management, education, training, and sociological aspects, among others. Its *modus operandi* could be similar to that of the *Tomistoma* Task Force, beginning with the creation of a member list and outlining objectives and proposed actions.

**IUCN STATUS OF GHARIAL—CONSIDERATION OF REVISION:** Currently, *Gavialis gangeticus* is listed under IUCN Endangered Criteria C.2.a. and E, based on information and population projections offered at the PHVA analysis in 1996. Despite a 50% decline in the last six

years, numbers are still above Critical category threshold.

**LATEST INFORMATION:** The cause of decline appears to be related largely to accidents in fishing nets. The maximum decrease has been observed for the smallest size class. An observed decrease of 30–40% of adult/sub-adult gharials between 1998 and 2003 works out to a 6–8% annual reduction in the population.

In terms of the current management of the Chambal in the three states (Rajasthan, Madhya Pradesh, and Uttar Pradesh), the major problems are overburdening of staff, financial issues (costs of management plan implementation and sanctuary maintenance), and the lack of a management plan in one state. Major threats to the sanctuary are agriculture, water abstraction, fishing (fishing activity has been recorded at 60–75% of the Chambal River within the sanctuary), and sand mining (which provides US\$5.35 million for Rajasthan). — Rom Whitaker, presented by Nikhil Whitaker, P.O. Box 21, Chengalpattu, India 603001 <[draco@vsnl.com](mailto:draco@vsnl.com)>.

## **Tomistoma Task Force**

**UPDATE ON *TOMISTOMA SCHLEGELII* CONSERVATION AND RESEARCH ACTIVITIES IN INDONESIA, 2002-2004: REPORT FOR THE CSG STEERING COMMITTEE.** Sumatra: In 2001-02, Wildlife Management International Pty. Limited conducted field surveys in the Merang River and Berbak National Park (southeast Sumatra), and the first National Workshop on False Gharials (Palembang, South Sumatra Province). Both sites had not been surveyed for false gharials since WMI surveys in 1995-96. These activities were undertaken with the support and participation of Wetlands International, who currently manage a GEF-funded project in Berbak National Park. In the Merang River, surveys revealed intensive illegal logging in documented nesting habitats and a decline in false gharial densities. In Berbak National Park, large areas of potential nesting habitat were burned by forest fires in 1998-99.

The 2002 workshop raised awareness of the species among provincial government and academic agencies. The importance of a longer-

term project in the Merang River to address illegal logging and biodiversity conservation was identified. Site-specific management recommendations for false gharial conservation were developed.

Since 2002, Wetlands International has continued conservation efforts in the Merang River, with the following activities and results:

- Rapid field assessments of the Merang-Kepahiyang peat swamp forest system;
- Agreement from local government to convert the land status of the river from "Production Forest" to a "protected area" designation;
- Formation of a government team and extensive stakeholder consultations to address conservation of the Merang River;
- Development of a five-year "Strategic Action Plan" for the Merang River;
- Initiation of community development activities and demonstration models to block illegal log canals, with involvement of a local NGO;
- Assistance with police operations to halt illegal logging in the Merang River.

Much WI financial assistance has been provided by the WI Berbak-Sembilang Project, which expires in 2004. After surveys in 2002, WMI promoted the possibility of a longer-term project among international agencies but, despite much interest, no funding was located.

There have been no false gharial surveys in the Merang River or Berbak National Park since 2002, but it seems likely that populations remain under pressure from logging and loss of nesting habitat.

Large areas of eastern lowland Sumatra remain unsurveyed for false gharials. Most of these regions (Riau, Jambi and South Sumatra Provinces) are currently subject to extensive land conversion for oil palm plantations, logging, and cultivation. It is likely that many areas of potential *T. schlegelii* nesting habitat are being impacted.

Kalimantan: Kalimantan remains the largest unsurveyed region for false gharials in Indonesia. Kalimantan supports larger areas of remnant swamp forest than Sumatra, and may support larger false gharial populations.

The TTF currently has identified surveys of *T. schlegelii* in Kalimantan as the highest priority for conservation efforts of the species. Surveys may include small-budget rapid assessments (to document baseline data on distribution and abundance) and longer-term projects that may incorporate false gharial autecological studies with wider swamp forest conservation activities.

In 2003, the People, Resources, and Conservation Foundation (PRCF), a small international NGO with project offices in West Kalimantan province, submitted with M. Bezuijen an (unsuccessful) application for Kalimantan surveys to the Keidanren Foundation (Japan). The PRCF is now developing a second funding proposal (US\$10-15,000) for the Nando Peretti Foundation. The TTF has supported both applications, and the PRCF has offered the TTF as much logistical support as possible (including a project base and facilitation) for false gharial surveys in West Kalimantan.

The PRCF recently received a funding application from a local student at Tanjungpura University (West Kalimantan province) to study false gharial habitats, and committed US\$500 for the study. Pfaff (Curator of Herpetology, Riverbank Zoo) is currently applying for an AZA Conservation Endowment Grant (US\$30,000) to assist TTF in Kalimantan surveys. His application is based on the PRCF grant submitted to the Keidanren Foundation (with permission of M. Bezuijen and PRCF).

Java: Surveys by M. Auliya in Ujung Kulon National Park (western coast of Java) in 2001-03 confirmed the presence of *T. schlegelii* in a small area of swamp forest. The population is probably small and at the edge of the current range of the species.

Other: Other studies on the false gharial in 2002-04 include an assessment of *T. schlegelii* phylogeny and taxonomy and the distinctiveness of false gharial populations between central, eastern, and western Kalimantan. A paper on the historic and current global distribution of the species is currently being prepared.

Other false gharial conservation efforts in 2003 include WMI's submission of a fact sheet on the species to the ASEAN Peatland Management Initiative, and TTF's compilation of current information gaps and priorities for conservation of the species. — Mark R.

Bezuijen, *Regional Representative, TTF--Indonesia, Suite 101-102, 131 Bui Thi Xuan St., Hanoi, Vietnam* <mbezuijen@hotmail.com>.

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**TOMISTOMA PROJECT IN EUROPE.** In Europe, *Tomistoma schlegelii* are kept by a few zoological gardens, institutions, and private keepers. The animals are widely scattered, and there have been no attempts to breed them.

The conditions in which the few animals in Europe are being kept may ensure the long-term survival of the animals, but are not suitable for breeding. Several facilities house only one animal. Despite AZA recommendations, European zoos have made no attempt to manage the species with their conservation in mind.

In Riga, Latvia, in April 2004, the TTF-Coordinator for Europe, Ralf Sommerlad, Dr. Markus Baur, Institute for Zoology, Fish Biology and Fish Diseases of the LMU Munich, Prof. Rudolf Hoffmann of the Zoological Garden Karlsruhe, and Henk Zwaartepoorte of the Rotterdam Zoo were unable to establish an EEP, but there is the prospect of a European Studbook (ESB, [www.studbooks.org](http://www.studbooks.org)). This situation may prove to be very auspicious, as TTF's efforts to do conservational breeding of *T. schlegelii* could be coordinated externally and less bureaucratically by the initiators themselves.

We recommend a combination of different approaches:

(1) Each individual animal should be registered and catalogued. Individual parameters—i.e., age, sex, state of health, and keeping conditions—should be registered and documented. Current locations of *T. schlegelii* in Europe are:

- Alma Ata, Kazakhstan
- Amsterdam, The Netherlands (Artis Zoo)
- Eskilstrup, Denmark (Krokodille Zoo--private)
- Pierrelatte, France (La Ferme aux Crocodiles; private zoo)
- Moscow, Russia (Moscow Zoo)
- Riga, Latvia (Riga Zoo)
- Studen, Switzerland (Steiner's Park Seeteufel; private zoo)
- Berlin, Germany (Tierpark Berlin)
- Dvur Kralove Zoo, Czech Republic
- Fungirola Zoo, Spain
- Ulm, Germany (Tierpark Ulm)

Also, 11 subadult and juvenile animals of unknown sex are with a private keeper, Mr.

Prochazka, in the Czech Republic.

(2) Because research has shown that there might be different forms of the false gharial, it is imperative, especially in zoos, to know the exact origin of the animals. Dr. Jens Poschadel of the University of Hamburg was able to raise funds and provide facilities to do genetic analyses of the animals.

(3) Clinical examinations and blood chemistry are also highly advisable and could be performed and / or coordinated by the Institute for Zoology, Fish Biology and Fish Diseases.

(4) In addition to general health monitoring and blood tests, stress and sex hormone levels should be determined. This would make the management and a continuing surveillance of the European population possible. Talks with various institutions regarding the establishment of such a cooperation are currently underway. A doctoral thesis (in veterinary medicine) on this theme currently is being drafted.

(5) In addition to the hormonal supervision of the animals, an ultrasound examination of the females' ovaries and the collection and analysis of males' sperm would be advisable.

Based on this data, it should be possible to optimize the keeping of the individual animals. However, as a basis for comparison, more complete hormonal and genetic data is required. This may be possible through cooperation with Uthen Youngprapakorn, Thailand, and Joon Soon Jong, Sarawak. The origin of Mr. Jong's animals is known.

Given the small number of *T. schlegelii* in Europe, all facilities should be included in an ESB to develop cooperation among them.

Currently, we are in the process of gathering funds and resources by publishing articles with the German Herpetological Society (DGHT), the BNA, and the Zoological Society for Conservation of Species and Populations (ZGAP), as well as via print media. An exhibition about crocodiles, conservation, and sustainable use and about *T. schlegelii* is planned at the Institute for Zoology, Fish Biology and Fish Diseases in Munich for July this year. The Friends of the Reptile Rescue Center of the Institute of Zoology, Fish Biology, and Fish Diseases provides logistical support for our work and that of Dr. Poschadel.

Others who have promised their support are Dr. Schildger (Zoo Basel, Switzerland) and Dr. V. Hegel (Zoo Karlsruhe, Germany), as well as Mr. Zwaartepoorte (Zoo Rotterdam, Netherlands). These institutions do not house *T. schlegelii*, but they are very influential and are highly regarded among the European zoo community.

Detailed documentation of the current situation of *T. schlegelii* kept in Europe is essential to the success of this project. Secondly, appropriate breeding facilities should be provided.

As coordinators of this project, we should view it as our duty to continue acting in an advisory capacity to the facilities in Europe that house *T. schlegelii*. Only then can we aspire to the establishment of specifically formed breeding groups, possibly even through the integration of private keepers and/or small zoos.  
— Ralf Sommerlad, *CSG – TTF, Regional Chair Europe <crocodilians@web.de>* and Dr. Markus Baur, *Institute for Zoology, Fish Biology and Fish Diseases of the LMU Munich, Germany.*

**PHYLOGENETIC ANALYSES OF *TOMISTOMA SCHLEGELII*.** Because of the current alarming state of *Tomistoma schlegelii*'s conservation status, the CSG may soon classify the species as critically endangered. It is therefore essential that management plans for captive breeding are developed in a timely manner and the species is restocked in selected habitats.

Several researchers (G. Webb and M. Auliya) have proposed the existence of subspecies of *T. schlegelii*. However, due to the distributions of the species, it is necessary to conduct phylogenetic research prior to any reproductive efforts in captivity. Allopatric populations may be genetically distinct and morphologically distinguishable, and demonstrate varying ethoecological aspects (this may definitely be true for upriver populations and those from peat swamps!). Further, genetic incompatibilities might occur between specimens of different origin.

Appropriate DNA-analyses will be done using a hypervariable segment of the non-coding d-loop region (mtDNA control region) with a length of app. 400 basepairs. This marker is frequently employed for phylogenetic questions in species. For the interpretation of our results, it will be essential to obtain as many reference

samples of specimens with definitely known origin as possible.

Specific primers for PCR procedures will be designed based on nucleotide sequence data provided by Ray and Densmore (2002) and others. The preferred source material for DNA extractions will be blood samples, but alternatively teeth may be used following the procedures described by Comstock et al. (2003).

The sequence analyses will be lead by Dr. Jens Poschadel at the Biocenter and Zoological Museum Grindel, University of Hamburg, initially sponsored by me-di-co GmbH, Hamburg. Additionally, population structure analyses based on microsatellite frequencies are planned, hopefully in cooperation with the working group of Dr. Manfred Schartl of the University of Würzburg. Microsatellite analyses are suitable for estimating gene diversity rates in populations and thereby will provide a basis to avoid inbreeding effects and inbreeding depression in captive breeding stocks. — Dr. Jens Poschadel, *Biocenter and Zoological Museum Grindel, University of Hamburg, Edmund-Siemers, Allee 1, D-20146, Hamburg, Germany <poschadel@web.de>*.

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## Philippine Crocodile Interest Group

MINUTES OF PHILIPPINE CROCODILE INTEREST GROUP MEETING, 27 MAY 2004, DARWIN, AUSTRALIA. Present: C. Banks, Melbourne Zoo, Australia (convenor); J. Miranda, San Mariano Local Government, Philippines; B. Turan, Mabuwaya Foundation, Philippines; M. van Weerd, Leiden University, Netherlands; T. Cullen, The Cullen Vivarium Wildlife Conservancy, USA; B. Henley, Gladys Porter Zoo, USA; R. Hedegaard, Krokodile Zoo, Denmark; and T. Tsubouchi, JICA,

Japan (currently based in Borneo).  
Apology:  
C. Stevenson, Australia.

INTRODUCTION: C. Banks welcomed everyone to the meeting and requested brief introductions from all present. It was noted that the *C. mindorensis* populations in northeast Luzon are being managed well by the group based at the Mabuwaya Foundation and Local Government Unit in San Mariano. Additional funds are always welcome, but good progress in being made in this area.

Management and conservation of crocodiles in the Philippines continues to progress quite slowly. First, to address this, we need a person permanently stationed in the Philippines, with the necessary commitment, knowledge, and strength to follow up such issues with the PAWB (although not necessarily full-time, at this stage). Secondly, completion of the genetics study should be treated as a very high priority. This study includes the analysis of the blood samples currently located at the Palawan Wildlife Rescue & Conservation Centre (PWRCC). The possibility that many or most of the original founders, who are recorded as being from Mindanao, are coming from elsewhere was noted via comments by T. Tsubouchi on the likelihood of these actually being obtained from private collectors/breeders rather than direct from the wild. *Action:* C. Banks will follow up on the status of the samples at PWRCC and their transfer to Omaha, Nebraska, USA for analysis.

Finally, there is a need to address the operational issues at the PWRCC and assess the diversity of the *C. mindorensis* held there. It is possible that many of these crocodiles could be related.

#### ISSUE #1: SURVEYS:

- Target those islands for which there are historical data for *C. mindorensis*.
- It was noted that Charles Ross did not visit Luzon in his 1982 surveys and that an amount of his information was/is based on secondary reports.
- Frederick Pontillas' field trips in 1999



Philippine Crocodile Interest Group, meeting in Darwin. J. Thorbjarnarson photo.

were very short—as short as 1-2 days in some areas, and the trips were targeted at specific locales rather than being broad-scale.

- Need to follow-up on anecdotal reports for the Central Cordillera (including Abra Prov.), noting that much of this country is very rugged (surveys must be done on foot) and rocky (therefore very few crocodile tracks).
- Samar Island has historical records and still has forests, but is not particularly safe to visit.
- Lake Naujan on Mindoro still produces eye-shine reports.
- M. van Weerd noted that he now has a contact at Iligan State University in Mindanao and will be pursuing this in the next two weeks. Possible that students will be able to conduct surveys.
- T. Tsubouchi referred to a famous crocodile hunter, who was living in Davao City and could be very valuable in helping to identify original localities of *C. mindorensis* (was an Air Force captain at one time).
- Also noted that Patrick Regionel (ex-CFI) might also be able to assist with original localities; he usually participated in field surveys (could locate via Rainier Manalo at PWRCC).

*Action:* M. van Weerd and team will figure out the cost of developing the various surveys and training the other groups (in crocodile monitoring, tracking, etc.).

ISSUE #2: RADIO TRACKING: It was noted that funds have been obtained for the necessary equipment, but support is needed for training in the use of the equipment. Such knowledge is readily available in Australia and the USA, with the main cost being return airfares. *Action:* M. van Weerd to advise on best time(s) for training and C. Banks / T. Cullen to investigate possible trainers.

ISSUE #3: COMMUNICATION WITH THE PWRCC: It was noted that it is usually very difficult to contact the PWRCC directly. There are no land lines, no fax lines, and very intermittent and often nonexistent e-mail and cell phone service.

However, C. Banks can usually obtain immediate e-mail responses from Rainier Manalo, via the latter's personal e-mail. Noted that cell phone contact should not really be a problem, as almost all of the Philippines has such cover. Could a satellite dish be the answer? In view if the PWRCC's importance for *C. mindorensis* conservation, such poor / unreliable communication is a major problem.

It was also noted that PWRCC staff are still catching wild, "troublesome" *C. mindorensis* and placing them in the Center. They questioned whether or not this is appropriate.

*Action:* C. Banks will clarify the nature of communication difficulties with the PWRCC. Since the Darwin meeting, an e-mail was received from G. Rebong with a new address, so hopefully this will result in more reliable communication from now on.

ISSUE #4: INFORMATION CENTER: J. Miranda outlined plans for a Philippine Crocodile Information Center in San Mariano town, integrated with a children's playground and located close to two major churches (so people will regularly pass the Center). The total cost of the Center is approx. US.\$20,000 and the San Mariano LGU has allocated approx. US.\$7,000. Hence, about US.\$14,000 is still needed.

*Action:* J. Miranda to provide T. Cullen and C. Banks with costed proposal in order to assist them in sourcing the needed funds.

ISSUE #5: SAN JOSE HOLDING PEN: B. Turan noted the need for training for the caretaker in basic husbandry, to improve management of the captive crocodiles. This could be delivered via the Zookeeper Training Course at Bacolod in early November. It was suggested that this pair of crocs. be bred, and was generally agreed that this is worth pursuing, although it must be properly planned in advance. Noted strong need for husbandry training, clear identification of benefits, plan of likely modifications to the facility and plan for use of subsequent hatchlings (retain some, some to be released, etc.). If any are released, this could provide a good

media/community opportunity, including being blessed before release.

*Action:* B. Turan / C. Banks to develop a full plan to support captive breeding.

ISSUE #6: LAW ENFORCEMENT: J. Miranda spoke to the need for better law enforcement, noting that San Mariano has the necessary laws, but lacks enough police to implement them. He suggested creation of a local protection group ("Bantay"), a process that is working successfully in other parts of the country. T. Cullen noted the preference for involving the "established police" in some way to enhance the likely success of such a group.

*Action:* J. Miranda to identify required costs (equipment, training, honorarium, etc.).

ISSUE #7: MABUWAYA FOUNDATION: M. van Weerd noted the need for an appropriate Filipino to act as the Foundation's "Project Officer," but this can wait until 2005. Also the need to train Foundation members (e.g., suitable training in Australia/US).

*Action:* C. Banks/T. Cullen to identify appropriate training opportunities.

ISSUE #8: GENERAL PROMOTION: T. Cullen raised several suggestions for generally promoting Philippine crocodile conservation:

- Cross visits from other municipalities to see first-hand how the program is being conducted in San Mariano.
- A "crocodile fiesta": C. Banks noted that such an event happens every March in Puerto Princesa City and is very helpful in maintaining the profile of crocodiles.
- A Roman Catholic priest could bless the Philippine crocodiles at an appropriate time/event each year.
- Develop a sister city relationship, not necessarily based around crocodiles, although that might help in raising the profile of crocodiles. M. van Weerd noted that there is already a church-based link with the Netherlands.
- Develop and present a "Certificate of Recognition" for anyone who assists with *C. mindorensis* conservation.
- Provision of t-shirts, posters, images and any other available material for sale/promotion at events in the US (noting that his organization pays no tariff on imports into the US). R.

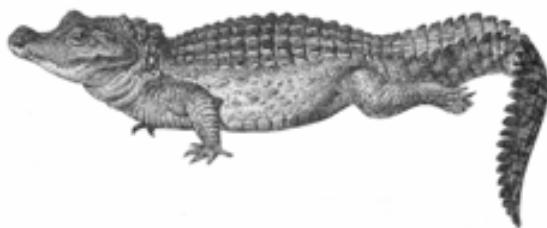
Hedegaard/B. Henley requested same for sale in Denmark/Gladys Porter Zoo.

- A letter of recognition/acknowledgment from the CSG for J. Miranda and B. Turan's attendance at, and participation in the CSG meeting.

*Action:* (1) C. Banks to contact Perran Ross re: letters for J. Miranda and B. Turan (since undertaken); (2) M. van Weerd/C. Banks to provide T. Cullen, R. Hedegaard, and B. Henley with materials for sale/promotion; (3) J. Miranda and Mabuwaya Foundation to explore other suggestions.

Minutes also sent to: Perran Ross; CSG Executive Officer; Grahame Webb; CSG Oceania Vice Chair; Colette Adams; Gladys Porter Zoo, USA; Jenny Daltry; FFI – Cambodia.

— Chris Banks, *The Melbourne Zoo, Elliott Ave., Parkville, Victoria, Australia* <[cbanks@zoo.org.au](mailto:cbanks@zoo.org.au)>.



## VETERINARY REPORT

VETERINARY REPORT FOR THE CSG 17<sup>TH</sup> WORKING MEETING. A preliminary note on the functioning of the Veterinary Section: The preparation of my book, *Crocodiles: Biology, Husbandry, and Diseases*, published in May 2003, took up most of my time, causing a considerable backlog of other tasks. This limited the time I spent on Veterinary Section matters, and as a consequence, my e-mail address list became almost completely obsolete. There were frequent consultations by Latin American colleagues, and I hope I was able to help in most cases. However, I failed to launch any useful in-group discussions and apologize for that.

I never distinguished between veterinarians who are CSG members and other crocodile vets, including both on my mailing list—as well as other CSG members who expressed an interest in participating in our discussions. I intend to be

more meticulous in the future and keep note of the status of the various names on my list.

### Some arising veterinary problems:

*Mycoplasmosis:* In South Africa, beginning in 2002, severe outbreaks of polyarthritis in juvenile crocodiles led to the discovery of a new *Mycoplasma* sp. in addition to the first finding of *M. crocodyli* in this country. The latter is linked to importation of stock, which leads to quarantine questions discussed below. The outbreaks caused severe economic losses on the affected farms. Thousands of small crocodiles had to be slaughtered when they became immobilized by the disease.

*Pitholes:* Complaints about small holes in crocodile skins and subsequent investigation led to the possible discovery of a putative infectious agent which appears to cause the formation of large cysts deep in the skin, which later heal and collapse but remain as deep holes in the skin and thereby cause permanent damage. Work on this condition and particularly on the identification of the agent is in progress, and the findings soon will be reported. This problem highlights the general problem of crocodilian skin defects or skin quality, and because of this it was proposed that a skin quality workshop be held at this year's CSG Working Meeting.

*West Nile virus:* Mortality in American alligators was blamed on insect-transmitted West Nile virus infection. We still are waiting for confirmation of this and more detailed reports.

*General:* Where crocodilians are kept in large numbers in unnaturally close proximity, one can expect new infectious diseases to surface and cause considerable losses. Constant vigilance and strict biosecurity measures always should be in place, and farmers or their veterinarians should keep in close contact with laboratories equipped to conduct investigations, if necessary. These laboratories should be apprised of the particular needs for work with crocodilian material, e.g., incubation at room temperature and at 37°C for isolating bacterial pathogens. Medical laboratories usually do not do this, nor are they usually equipped for the isolation of mycoplasmas. Medical pathologists also may not be aware of the peculiarities of reptilian pathology. In fact, this applies even to many veterinary pathologists.

*Cell lines:* An ongoing problem encountered when trying to work with crocodilian viruses is the lack or unavailability of suitable cell lines for the propagation of the viruses. There are at least

two viruses in Nile crocodiles, Pox- and Adenovirus, for which diagnostic antigens as well as vaccines could and should be developed. This point needs further discussion.

**Stress and bones:** A few more striking cases of stress-related bone pathology have been seen recently. This visibly emphasizes the important role played by stress in farmed and captive crocodiles. This is not a local problem, but because it is affecting all crocodilian species; this problem should be tackled by establishing cooperation on regional and international levels. The concomitant decalcification of teeth and in severe cases even toothlessness gives us a crude clinical tool to recognize severely stressed crocodiles even from a distance without the need in every instance to resort to the analysis of blood samples for stress hormone levels.

**Humane slaughter:** The question of humane slaughter arose with the reviewing of the Australian Code of Conduct proposals. This is important and sensitive because (a) we ourselves do not want to cause unnecessary pain in the animals with which we work, and (b) in light of "green" and animal rights scrutiny, we dare not be seen as producing "factory" crocodiles and being "cruel" to them. The problem consists of two separate facets: stress reduction and causing zero or minimal pain.

**Stress:** Causing excessive levels of stress can well be perceived as cruel, but there is another tangible consequence: stress septicaemia, which can lead to high bacterial counts in the meat in spite of high standards of post-slaughter hygiene. The most common cause of pre-slaughter stress is handling and muzzling the crocodiles as well as their transport alive to the abattoir. The first is done on many farms to avoid slaughtering crocodiles with fresh scratches on their skins in the hope that the skins heal before the animals come up for slaughter again. The second is done to shorten the interval between killing and evisceration, aiming to prevent leakage of intestinal bacteria into the carcass. However, no such leakage takes place for many hours after slaughter.

**Pain:** The brain continues working as long as there is sufficient oxygen. Crocodile brains can function on very low levels of O<sub>2</sub>. We know that in chickens the brain remains active for up to 30 seconds after decapitation. In crocodiles, where the brain is sometimes subjected to a low supply of oxygen, this time is estimated to be up to 30 minutes, according to eye reflexes and movements. Therefore the neck stab alone certainly is not acceptable as a humane method, and even subsequent brain pithing takes at least 20 to 30 seconds to complete. The pain caused by the stab will still be perceived as long as that.

Any really humane method needs to induce an immediate unconsciousness. This can be achieved by shooting a low-load, small-caliber bullet directly into the brain and thus destroying it completely. This method is not possible where the supply of such bullets is limited, as in some African countries, or where the crocodile has to be handled before slaughter (e.g., for examining the state of the skin; see above). However, any handling of the crocodile prior to slaughter can trigger stress septicaemia, which leads to higher bacterial counts, including salmonellae, in the meat. There is also the question about the real usefulness of examining the skin prior to slaughter. How long will it take for the observed wounds and scratches to heal to the extent that a



Charlie Manolis, Grahame Webb, and Thomas Rainwater measure the length of a *C. johnsoni* caught in the McKinlay River, Australia, during the CSG Working Meeting field trip. J. Thorbjarnarson photo.

perfect skin could be obtained?

Alternative methods include the captive bolt method, "Zilka," developed in Brazil (although

this also requires handling of the crocodile to be slaughtered), or stunning with the Australian electrical device. While the latter stuns the animals effectively, the drawback is that the spastic movements at the beginning of the stunning phase alert the other crocodiles in the pen and cause them stress. Shooting the unsuspecting crocodile, however, does not upset and stress the other animal because the shot crocodile remains motionless.

Regarding the neck stab method: I have not been able to find out details about the innervation of the affected neck region. If the nerves in the region of the stab enter the spinal cord caudally of the stab, then the brain should not be able to perceive the associated pain after the spinal cord has been severed and this would give us time for pithing the brain. On this issue, anatomists will have to help us find an answer.

A hammer blow to the chisel used for severing the spinal cord does not stun the brain. Even a nail driven through the brain with a hammer blow does not induce unconsciousness. In this context, the term "consciousness" is not the philosophical one sometimes used to differentiate between man and animals; it refers simply to the state of being able to receive peripheral nervous inputs and reacting to them. A hammer blow to the skull over the brain can be used to stun a crocodile when other methods are not available (e.g., when a live crocodile is presented for post-mortem examination).

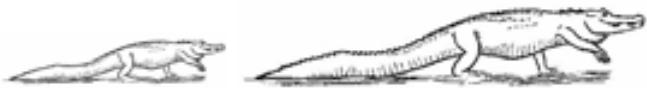
Quarantine of traded live crocodiles: Trade in live crocs for farming appears to be on the rise in Southern Africa. In one case this had led to the introduction of a pathogen (an outbreak of polyarthritis caused by *Mycoplasma crocodyli* previously unknown in South Africa). This highlights the need for a uniform and enforced quarantine procedure and/or health certification system for cross-border trade in live crocodiles. We hope that soon we shall have suitable *Mycoplasma* antigens for serological testing of quarantined crocs or animals to be certified.

Further difficulties arise from the lack of cooperation among South African and Zimbabwean farmers' associations. As such, action cannot come from within, although efforts are afoot. The situation is further complicated in South Africa because the provinces act independently in matters of conservation; consequently, CITES permits are administered at a provincial rather than national level and with

varying strictness. Additionally, the veterinary



Sampling the Aussie "tucker" at the farewell banquet are, r to l: Ruth Elsey, Jon Wiebe, Don Ashley, and Mushtaq Ahmed. J. Thorbjarnarson photo.



authorities do not \_\_\_\_\_  
for purposes of meat hygiene.

It is proposed that the CSG, via its regional Vice Chair, approach the relevant authorities in the region (Southern and East Africa) to discuss this matter. Ideally CSG would initiate the process of introducing a uniform system of health certification and quarantine for live crocodiles to be transported across borders.

Further matters of concern were the importation to South Africa of a large consignment of crocodile meat from a neighboring state, which was then certified as being of South African origin. The question arises: does crocodile meat require CITES certification? Also, crocodile handbags that were probably from Central Africa recently appeared at a popular crafts market in Johannesburg. — Fritz Huchzermeyer, *Onderstepoort Veterinary Institute, P.O. Box*

12499, Onderstepoort 0110, South Africa  
<crocvet@mweb.co.za>.

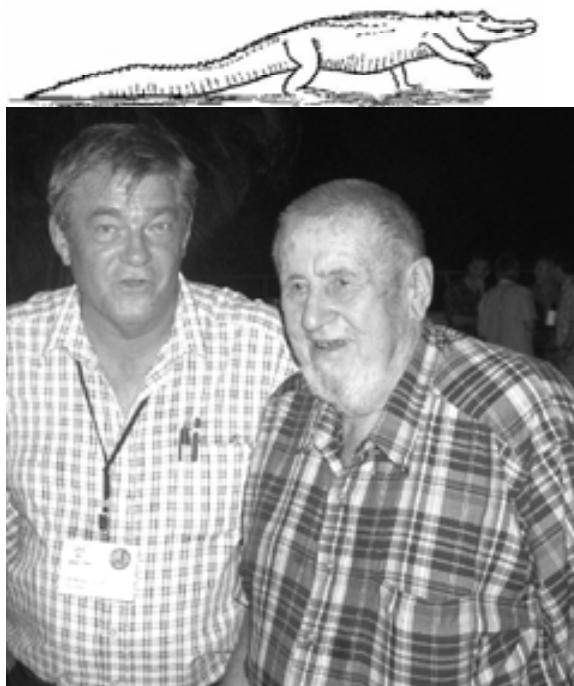
## **Harry Messel Receives Peter Scott Award**

PROFESSOR MESSEL AWARDED SSC SIR PETER SCOTT MEDAL. In a surprise ceremony on 25 May, at the Darwin's Government House, Species Survival Commission Chairman David Brackett awarded the Peter Scott medal to CSG's Professor Harry Messel. The Peter Scott Award for Conservation Merit is granted by the Species Survival Commission in the name of the late Sir Peter Scott, whose commitment to global conservation, IUCN, and SSC left a legacy of achievement recognized throughout the global conservation community. Sir Peter was chairman of the SSC from 1963 to 1967 and has been described as one of the fathers of conservation. Sir Peter Scott led a crusade for endangered wildlife that inspired many to take action to protect wild animals and their natural environments. Under his leadership, the SSC developed into a vast, effective body of specialists whose expertise is drawn upon by conservation practitioners and policy makers around the world today.

The medal is awarded on an occasional basis to recognize outstanding contributions by an individual to conservation and the work of SSC. Previous recipients include sustainable use proponent Marshal Murphree, population biologist Graeme Caughley, Al Gentry (developer of Rapid Assessment Programs), and SSC Chair George Rabb.

In presenting the award, David Brackett cited Prof. Messel's long record of activity, beginning with the initial surveys and protection of saltwater crocodiles in Australia in the late 1960s. In addition to the Prof's 15 years as Chairman of CSG, Brackett thanked him for a decade of service on SSC's executive council, advice and assistance to other specialist groups and chairs, and his continuing commitment to excellence in science education.

### **Personals**



CSG Chairman-elect Grahame Webb and Chairman Prof. Harry Messel. J. Thorbjarnarson photo.

THANK YOU FROM VAL LANCE. A note to let CSG members know that I am slowly recovering

from last October's devastating fire. I now have the beginnings of a library as a result of the generosity of friends. In particular I would like to thank CSG and Eric Thiss of Zoobooks for a complete replacement set of the CSG proceedings, and Ruth Elsey and Kent Vliet for their extremely generous gifts of hard-to-replace books and reprints.

Kathleen and I are in the process of rebuilding our house, though still only at the stage of reviewing architectural drawings. By late next year we hope to move back and have a grand house-warming party to which we hope to see some of our CSG friends. With heartfelt thanks. — Val Lance, *San Diego State University, Graduate School of Public Health, 5500 Campanile Dr., San Diego, CA 92182, USA* <[lvalenti@sunstroke.sdsu.edu](mailto:lvalenti@sunstroke.sdsu.edu)>.

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## Steering Committee of the Crocodile Specialist Group

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