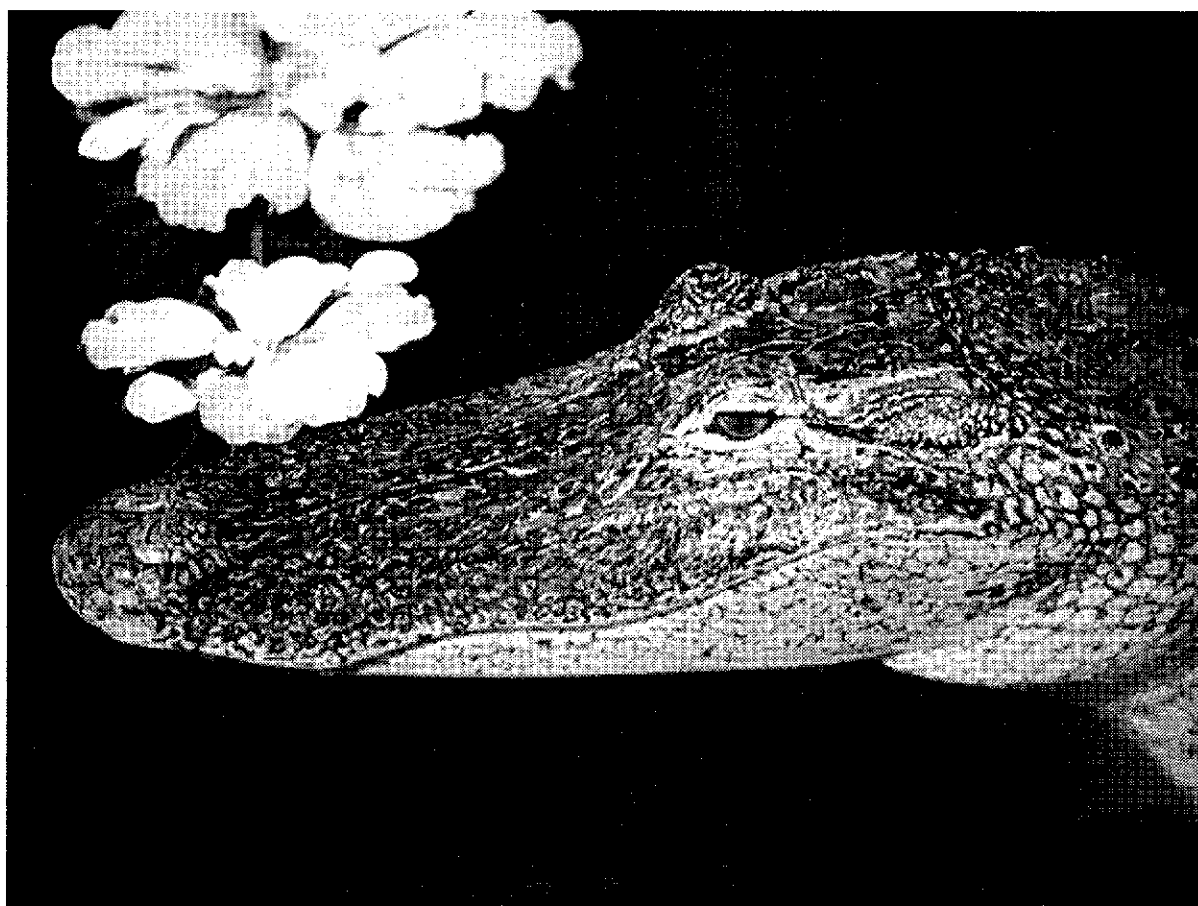


CROCODILE SPECIALIST GROUP

NEWSLETTER

VOLUME 17 No. 3 ■ JULY 1998 - SEPTEMBER 1998



IUCN - World Conservation Union ■ Species Survival Commission

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VOLUME 17 Number 3
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IUCN--The World Conservation Union
Species Survival Commission

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COVER PHOTO: *Alligator mississippiensis*, a six foot
resident of Lake Alice, Gainesville Florida. Erika
H. Simons photo.

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

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Singapore.

EDITORIAL

WHAT IS CSG WORTH?? Recently David Brackett, Chair-
man of our parent body the Species Survival Commis-
sion of IUCN, asked each Specialist Group to estimate
the dollar value of its activities in conservation. After
considering all the many ways that CSG operates, we
came up with a figure of approximately half a million
dollars US per year in services and activities – a sur-
prisingly high amount.

We know that CSG brings in an average of around

\$70,000 US annually from general donations (approx.
88%), special project donations (varies 5% – 15%),
Newsletter subscriptions (4%) and sales of publications
(4%). This cash budget supports the general office ac-
tivities, executive officer, Newsletter and occasional
other expenses such as meetings and production of
publications. However, the cash budget does not begin
to fully reflect the costs either of our central office or
of our operations as a whole.

We are privileged to receive free office space,
utilities, electronic access and general support from the
Florida Museum of Natural History at the University
of Florida – in kind support that could be evaluated at
fair market value of around \$650/mo. rent, \$30/mo.
e-mail or \$8,160/yr.

Putting a cash value on the activities of the Chair-
man, Steering Committee and membership is difficult,
but we assigned estimates in the following way:

Prof. Messel does at least one international trip for
CSG a year, which he estimates to cost \$5,000 - \$10,000
from his personal funds. He also incurs extensive com-
munication costs, for fax, phone, mail and e-mail, as
do all our Vice-Chairmen. Some of these expenses are
supported by each member's institution or business, but
some is out-of-pocket. Some of our Steering Commit-
tee have indicated during discussions of funding that
they estimate they expend \$2,000 - \$5,000 /yr. in com-
munications, travel and dedicated time, although this
is somewhat variable among different members – but
conservatively, say 1/3 of our Committee do so in any
given year at an intermediate level – then that's $13 \times$
 $\$3,000 = \$39,000/\text{yr.}$

The membership is the hardest level to put a cash
value on. I know that this year 65 members traveled at
their own expense to our meeting in Singapore and
stayed at a cost of around \$150/day for 7 days. If aver-
age travel costs was \$1,500 then that would count $65 \times$
 $\$2,550 = \$165,750$ in actual direct costs by members
in 1998. In addition there is huge expenditure by mem-
bers pursuing their own activities, from which CSG
directly benefits. As an example, this Newsletter con-
tains a very valuable report from member Bill Thomas
in Zambia, reporting on the presence of *Crocodylus*
cataphractus. If CSG mounted a dedicated expedition
to obtain this information the cost would be astronomi-
cal, certainly many thousands of dollars. As it is we
get the advantage of the expense Bill undertook. An-
other excellent example is the expenditures over the
last several years for surveys of *Tomistoma* in Indone-
sia which total more than \$120,000 obtained from Glo-
bal Guardian Trust, Japan, ACSUG, Smithsonian Insti-
tution, Chicago Zoological Society and direct expenses
incurred by CSG members such as Grahame Webb and
Wildlife Management International, Andy Ross and

Jack Cox. Our Indian members raised a grant of over \$25,000 to support their regional meeting in 1997 and of course our colleagues in Singapore expended a very substantial figure for the recent 14th Meeting. If we throw in an arbitrary average figure of \$500/yr per member in-kind support, dedicated time and communications – $365 \times \$500 = \$182,500$.

These estimates are not completely additive or constant, but quite reasonably total around \$500,000/year. Is this a reasonable estimate? Based on my prior experience in conservation organizations, I think if we had to achieve the same results with a fully funded non-profit organization then a budget of \$450,000 - \$500,000 would be a little low for what we accomplish. It is noteworthy that the ratio of total value of our efforts to donated funds is very high, over \$7 action for every \$1 donated. This is entirely due to the volunteer efforts of our CSG membership. Supported by our donors and coordinated by the Chairman and Steering Committee, served by your Executive Officer, together we have a significant impact on crocodilian conservation whether measured in dollars or results. – Perran Ross, *Executive Officer*.

VIEWS & OPINIONS

July 24, 1998

Prof. Harry Messel

Dear Prof:

I just received a copy of the new Crocodile Status Survey and Action Plan published by the Crocodile Specialist Group.

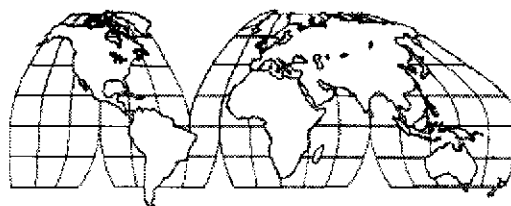
In leafing through this I was most impressed by the quality of this publication and the amount of work and information that goes into these Action Plans. Please pass on my congratulations to the rest of the Crocodile Specialist Group on a job well done, and to Perran for coordinating the project.

With my best wishes,

David Brackett
Chair
Species Survival Commission



AREA REPORTS



AFRICA

Ethiopia

THE UNFORTUNATE CROC. Recently, I was taking a trip to the countryside of northern Ethiopia. In this area, deep in the gorge, there are rivers that flow the whole year round to feed the great river, Blue Nile.

These rivers support a variety of life. Among them, crocodiles and a diversity of fishes are prominent. Though few in number, crocodiles are found virtually throughout the whole length of the river.

The people who reside alongside those rivers are known for their methods of catching fish by traditional means, using herbs, which indiscriminately wipe out fishes from the river. When I was there, they brought a powdered herb, which is kept in a sack. They seek out places in the river where they can dilute the herb in the flowing current. The moment the herb is mixed with the water it forms white bubbles and, surprisingly, the fishes start to come to the surface. When you look at the fishes they seem anesthetized. During this phenomenon, the fishermen start to fish using a netted basket, which resembles a basket ball net. Everybody uses their hands to strike the less affected fishes and continues collecting the poisoned fish.

One fishermen, while thus engaged, was heard screaming. He had accidentally stepped on a juvenile croc while wading in the river looking for fish. Unfortunately he recognized it as a large fish and used his fishing net to catch his presumed fish. After a long struggle, the man appeared with a netted crocodile in hand. He looked at it motionless for awhile. Then he shouted for help and everybody ran towards him and all grabbed the netted croc to keep it from causing harm. After releasing the croc offshore, they killed it mercilessly, while we were screaming and begging them to let it go. – Mr. Berhany Lakew, *Ethiopian Wildlife Conserv. Organization, P. O. Box 386, Addis Ababa, Ethiopia*.

Zambia

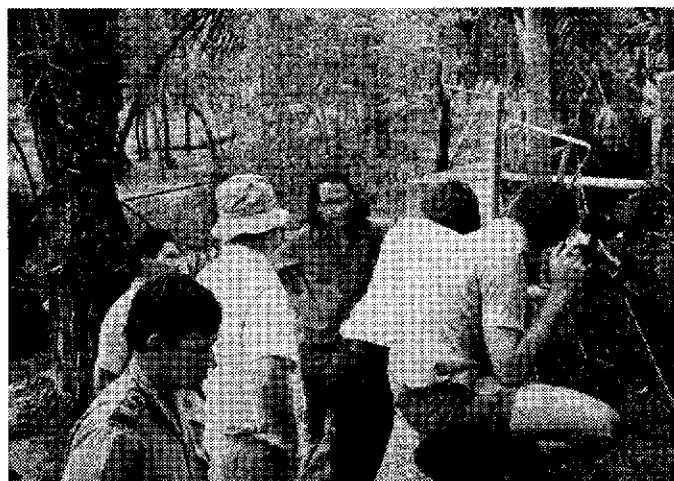
CATAPHRACTUS STILL FOUND IN ZAMBIA. I received a copy of the new Action Plan 2nd Edition, which I have enjoyed reading. I note that under the description for *cataphractus* it states "...may mean that *C. cataphractus* is now extinct in Zambia."

I am delighted to correct this by stating that last year I travelled to the Luapula Basin and collected three juveniles for our Reptile Park. The fact that they were juveniles indicates that there are still breeding pairs in the river and I hope to go again later in the year to endeavor to collect more. [The locality is approximately 10° S, 28° 30' E near the border of the Republic of Congo (formerly Zaire) and in the Congo River drainage. — Eds.]

Needless to say, these are purely for display purposes and not for commercial gain. We hope eventually to keep a nucleus breeding population that could be used for reintroduction to the wild if it proves practical. — Bill Thomas, *Kalimba Farms, P.O. Box 30131, Lusaka, Zambia*

Zimbabwe

VICTORIA FALLS ANNIVERSARY. 1998 marks the 20th anniversary of Africa's first crocodile workshop held at Victoria Falls, 19-22 September 1978. The workshop on crocodile rearing and farming was the inspiration of



Alistair Graham (center) reported on techniques for conducting aerial surveys in Botswana. B. Shwedick photo.

David K. Blake and John Loveridge. It was attended by 50 participants including biologists, wildlife officers and crocodile farmers. Presentations included a program called crocodile rearing (now known as ranching) the collection and artificial incubation of croco-

dile eggs for conservation and utilization purposes. — Bruce Shwedick, *Crocodile Conservation Services P.O. Box 3176, Plant City, FL 33564.*



Crocodile nesting and egg-laying was observed during the workshop at Spencer's Creek Crocodile Ranch. B Shwedick photo.

EAST ASIA, OCEANIA & AUSTRALIA

Australia

IT PAID TO SMILE AT A CROCODILE. Lillian Lever is one of Queensland's outstanding small business stories. Rural women like Mrs. Lever are providing a whole range of sorely needed employment opportunities for others. The experience of raising a family stands women in good stead for the task of caring for baby crocodiles at Koorana Crocodile Farm, which Mrs. Lever runs with her husband John. Koorana, 40 km east of Rockhampton, has stayed profitable despite a seven year drought and a fungal infection that threatened to wipe out the Lever's stock of hatchling crocs.

The Levers employ 13 people to help with the many facets of the business: farming, manufacturing, wholesaling, retailing and tourism. Value added products are a priority. Koorana is building an abattoir and has applied for a meat export license to meet huge demand from overseas buyers in Taiwan, Japan and France.

The prolonged drought has been especially tough on the crocodiles. It disrupts sperm production and the mating cycle, both of which are triggered by thunderstorms and the monsoonal rain. It is essential that the animals are well cared for to keep mortality to a minimum. Older women are thought to be more suited to looking after the hatchling crocs,

because they take extra care in handling and tend to be more observant. "Crocs are born nervous," Mrs. Lever said. "You have to treat them the same as human babies. They have to be very carefully monitored and handled."

"Women move more slowly around the animals. You can move around a pen of 200 four-foot crocodiles as long as you move calmly. "Women are also better at picking up on the smaller details that might indicate all is not well with the animals. This is important, because anything that is affecting the welfare of the animals can be caught at the stage where it can be fixed before something goes drastically wrong."

To deal with crocodiles' fungal infection problem, the Levers called on the expertise of Ms. Jamie Hibberd, a researcher in crocodile fungal diseases at Central Queensland University, who identified the problem as *Fusarium solani*, well known to crop farmers as citrus and tomato wilt. It took them three years and a lot of detective work to track down the source of the fungus to the crocodiles' nests, then come up with a way of treating their eggs to keep the fungal contamination within acceptable limits. The Levers had to overhaul many of their crocodile rearing practices. — From Kate Marshall, *Australian Financial Review*, June 1998.

Fiji

ACCOUNT OF A CROCODILE AT FIJI CIRCA 1806. "The people of Pau gave an account of an enormous lizard, which they supposed must have been sent by the gods from Bolotoo. Late one evening, a canoe put in at a neighboring small island, and the weather being very hot, and the crew much fatigued, they resolved to sleep during the night upon the open beach. After having been asleep some time, they were awakened on a sudden by the loud cries of one of their companions; when, starting up, they observed by the light of the moon, with the utmost astonishment, a prodigious lizard plunge into the water. At this they were greatly alarmed, and, missing a man, they went farther up the country for safety. Early in the morning, one of them went into the sea to bathe, and was snatched away by the monster. The whole island was soon in a state of alarm. Every body flocked to the beach, but no lizard was to be seen; and, in the course of the day, they who belonged to the canoe took their departure. A few days now elapsed, during which the prodigy was nowhere to be found and they supposed it was gone altogether, convinced of its having been the visitation of a god for some crime they had committed.

One evening, however, while a woman was washing some talo root in a salt water lake, about a quarter of a mile from the beach, surrounded by thick

rushes, the monster suddenly made his appearance, and, seizing the unfortunate woman plunged with her into the lake. The people of the neighboring houses having given the alarm, all the inhabitants of the island were soon up in arms, and, running to the spot, uttered loud exclamations and threw stones and various missiles into the lake. The animal, being disturbed, now rushed out, and made towards the sea, pursued by a number of men, who threw spears at him; but these were of no avail, his hard scales proving impenetrable to such weapons. This circumstance filled them with increased alarm and wonder, and convinced them in the opinion that it must be a god, for they saw him escape unhurt into the sea.

In this way he destroyed nine people at different places, when an old man, observing that he came on shore every morning at one particular place near the lake, in which he afterwards concealed himself, boldly devised a method to destroy him. He prepared a long rope, with a running noose at one end of it, which passing over the thick branch of a *feh*i tree that stood between the beach and the lake, while that end containing the noose hung down near the ground, at the farther end he placed fourteen or fifteen strong men concealed among high grass. The old man was a staunch warrior, and well fitted for such a perilous enterprise; and, having obtained the solemn promise of his confederates to act their parts with steadiness and fidelity, he undertook to walk about on the beach at the time the monster was expected, and, at its approach, to recede behind the noose, through which the animal must necessarily pass his head to lay hold of him. Matters being thus adjusted, the expected enemy made his appearance, and ran towards the old man, who took his station behind the noose, and, the moment the animal put his jaws through it, he sprang back, and gave the appointed signal. Instantly the cord was drawn tight and their prey was caught with his head and one paw through the noose. They soon secured the rope and running up, beat him about the head, and pierced him wherever they could, till at length, after much hard work, they killed him. When their toil was over, the first thing they thought of was to try if he was good to eat. Accordingly, selecting those parts which they thought the tenderest, they baked a sufficient quantity, and, finding it very good, made a hearty meal. From the description of the bones, as well as from what he had heard concerning the living animal, Mr. Mariner supposes that it must have been a crocodile which, by some accident, had made its way from the East Indies. And so it was the first of its kind the natives had ever seen or heard of, we need not wonder that they supposed it to be a supernatural lizard, sent by the gods from Bolotoo as

a punishment for their offences." — *FROM TONGA ISLANDS, WILLIAM MARINER'S ACCOUNT, Martin J. 4th edition 1981 Vava'u Press, Tonga. Originally printed 1817. Submitted by G. Webb, Wildlife Management International, P.O. Box 530, Sanderson, NT 0812 Australia.*

Thailand

BIRTHDAY JOY FOR WORLD'S LARGEST CAPTIVE CROCODILE. "Yai," the world's largest captive crocodile, celebrated his 26th birthday on Wednesday at a Thai zoo in the eastern outskirts of Bangkok with a special treat from his owners. They rustled up hundreds of well wishers to witness the special day with plenty of fanfare, party poppers, decorations laced with multi-colored balloons and lots of food. His owners gave Yai a birthday meal in a basket, hand-delivered by two chimpanzees, to the repeated strains of "Happy Birthday" wafting from a tape recorder playing in the background. The meal comprised three chickens, two sharks weighing a total of 10 kg (22 lb) and two ducks, which Yai devoured slowly but with plenty of relish.

Yai was born in captivity in 1972 at the Samutprakarn Crocodile Farm and Zoo. He was listed in the 1989 Guinness Book of Records as the largest captive crocodile having grown 19 feet and eight inches long and recording a weight of 1,120 kg (2,465 pounds). After 26 years, which is young for a crocodile, Yai has changed little. But he has put on some weight. "Now he has gained about 100 kg (220 lb) more," the managing director of the zoo, Charoon Youngprapakorn, told Reuters. He said Yai had brought much prosperity to the zoo, which also houses 62,000 other crocodiles bred in captivity, and which are fed chicken meat and bones almost on a daily basis. "Yai is well-known and has brought prosperity to our farm and that is why we have given him this present and brought people to celebrate it with him," he said. About two million tourists and visitors come annually to Charoon's crocodile zoo, touted as the world's largest, to see the star attraction Yai. — Sutin Wannabovorn, *Reuters 10 June 1998.*

WEST ASIA

Iran

MUGGER STUDIES CONTINUE. Since I wrote you last time, I visited the Salbaz River's ponds, where the crocodiles exist. Some detailed information was obtained by direct observations. I believe that the main threat to the hatchlings and the young, is the flash floods or the periodical floods which carry the young to the fast flowing rivers and from there to the sea, where the salty

waters kill them.

I am thinking of a system devised to protect the young and eggs from predators and flood. Humans don't seem to harm the animals in Iran. I am thinking of fencing off the nests or transferring the eggs to a safe place until they hatch. Further protection is needed until they get to a certain age and they are released into the river system.

One thing bothers me though. I am not quite sure if the rivers and the ponds are able to support the present population. I do not know if the food (or lack of it) would be a limiting factor to keep the population low. It seems possible to double the population in a couple of years time (by protection of eggs and young). I understand that they live on a tiny diet, but we have records of attacks on sheep, dogs, goats and even people especially in June and July (the breeding season). Many years ago a six years old boy was drowned by a croc. A sample of feces revealed a large proportion of insects! It is believed that they eat mudskipper (*Periophthalmus* spp.) and some other fish. The river was teeming with fish and the skippers when I visited the area a month ago. At this stage in my studies I need some detailed information on the breeding habits, physiology and the general behavior of *C. palustris*. — Dr. E. Kahrom, *Pasdaran Ave., Golestan No. 5, Tehran 16668 Iran, Tel. 254-9987.*

India

ANDAMAN CROCODILE AND WETLAND SURVEYS. Project director, Harry Andrews, trained A&N Forest Department personnel in wetlands assessment as well as monitoring populations of saltwater crocodiles (*Crocodylus porosus*) and the critically endangered Andaman teal (*Anas gibberifrons albogularis*). At the request of the Department ANET is currently developing an action plan for conservation and management of crocodiles and wetlands. — H. Andrews & Rom Whitaker, *Madras Crocodile Bank and Trust, Post bag 4, Mamalapuram, TN 406 104 India.*

LATIN AMERICA

Belize

NEW INITIATIVE FOR CROCODILE CONSERVATION. In view of the threatened status of *C. acutus* in Belize, the Government is taking certain immediate steps to try and ensure the continued survival of the species here, i.e. the inclusion of known nesting sites in existing or proposed protected areas. In addition the Government of Belize has issued itself with a permit to collect a cer-

tain number of *C. acutus* hatchlings from known nest sites. These hatchlings will be raised in captivity until such time as they reach a total length of 90 cm and then released into depauperate areas deemed suitable by the relevant conservation bodies of Belize. They will also, of course, form a very important reserve stock of the Belize genotype of this species, a good safeguard in the event of natural or otherwise environmental hiccups.

In order to achieve this I will be forming a Belize registered non-profitable organization under the laws of Belize to be known as the Belize Crocodile Crèche (BBC). The local population of *C. acutus* are already starting to hatch, so although I already have enough funds in hand to initially house and feed them, I had planned on a further year in which to amass the necessary funds to carry out the collection activities and prepare additional accommodation as the hatchlings outgrow their initial quarters.

There are no alternate locations in Belize at present to carry out this type of operation. The Belize Crocodile Crèche aims eventually to be an independent organization dedicated to the study of the reptile species of Belize with a definite priority given over to the preservation and further monitoring and study of both *C. acutus* and *C. moreletii*. It has no aims to become a commercial crocodile farm. Its aims are purely conservation oriented, although one of the ways in which the center will be raising funds in the future, is in the sale of captive bred, non endangered species of reptiles to the pet trade in both the United States and Europe. Fund-raising efforts are currently underway to raise about \$7,500 needed to meet the immediate expenses of this years activities. – Steve Nichols, P.O. Box 700, Belize City, Belize Central America.

GREETINGS FROM BELIZE. Things here are going well. The nesting season is in full swing. We've been out conducting nest searches for the last few weeks. Lou Densmore and one his students, Jennifer Dever, are now working with us and are both an excellent and welcome addition to the crew. Lou was here from June 28 through July 3, but had to leave for the Crocodile Meeting in Australia. Jen will be here through November doing population genetics work and will return for the next few years. The toxicology component of the project is moving along nicely. We've collected numerous samples (blood, plasma, serum, fat, non-viable eggs, soil, sediment, etc.) since last year and will soon be in the laboratory analyzing them. We've also collected lots of life history and population data and have marked and released over 170 animals. You should come visit sometime. – Thomas Rainwater, *Institute of*

Environment and Human Health, Dept. Biology, Texas Technical University, Lubbock TX 79417, USA.

Brazil

SKINS FROM WILD SPECTACLED CAIMAN CONFISCATED IN AMAZONIA. In 1995 a communication error occurred between one of us (RS) and the CSG. The CSG thought that RS had reported illegal skin trade in the Brazilian Amazon (newsletter 14 (2): 4-5, 6-7 and 12-13) but,

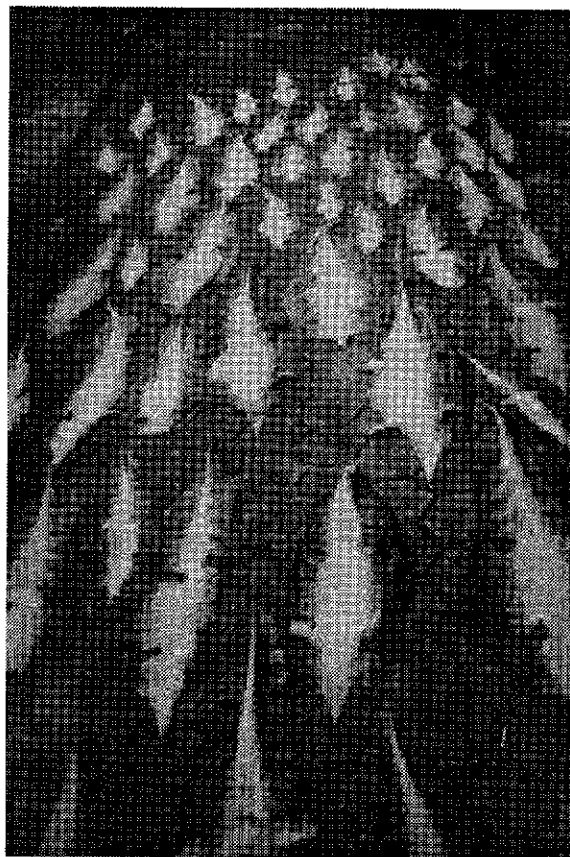


Fig. 1 Confiscated caiman skins. Da Siveira Photo.

in reality, the information was about illegal meat trade. CITES immediately made a survey of the markets of Leticia and found no evidence of illegal skins (newsletter 14 (3): 11-13).

We have been doing research in the Brazilian Amazon during the last ten years and not found evidence of illegal skin trade. The last figures we know of were from 1976-81 (Rebello and Magnusson 1983). Although some authors have generalized Brazilian Amazonian and Pantanal caiman trades, the situations are very distinct.

However, on May 5, the Brazilian Instituto for Environmental and Renewable Natural Resources

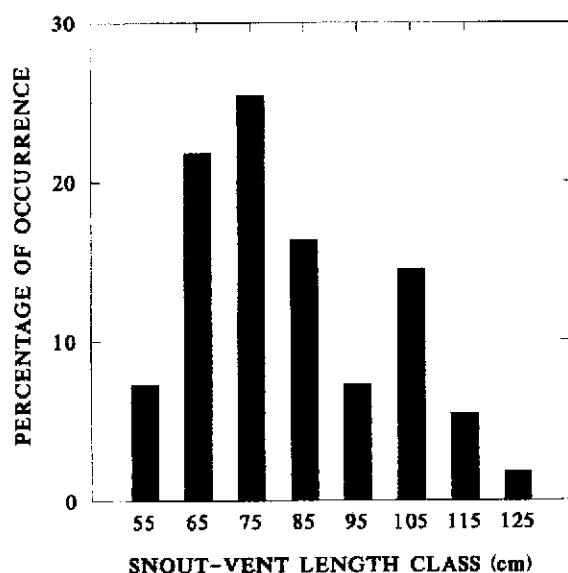


Fig. 2 Snout-Vent measurements of the 55 caiman skins.

(IBAMA) confiscated 55 spectacled caiman skins, *Caiman crocodilus crocodilus* (Figure 1). The skins were in the Campina Village, town of Caapiranga, Amazonas state, located 135 km Southwest of Manaus, near the Rio Solimoes (Amazonas).

We inspected the skins on June 16. They were not salted, but conserved in ice, whole and very well skinned. Of the 55 skins, 54% were probably females and subadult males (SVL < 80 cm). Over 29% were probably adult males (SVL > 90 cm). The smallest skin measured 57.5 cm SVL and the largest 125 cm SVL (Figure 2).

May is the wet season, and caimans are dispersed in the flooded forest, and the majority of big caimans are not visible. Probably this shipment resulted from one hard work week for at least two persons. We did not have information about where the skins were from, as the hunters ran when they saw the IBAMA officials, abandoning their 7 m wooden canoe with a diesel in-board motor, that was confiscated too.

With the skins were 15 tails of caimans of different sizes, that in total weighed 57 kg. All tails had bones and were not salted, which is strong evidence that the meat was destined for the Brazilian market. Meat of the caiman that is exported from Brazil to some other Amazonian countries is totally without bones, when transported and usually salted like catfish or pirarucu, *Arapaima gigas* (Da Silveira and Thorbiarnarson, in review).

We asked IBAMA to make more intensive and frequent efforts in the area to bring this situation under control, principally before next dry season (September-November), when caiman hunting could be more

intensive. Probably many other local people are hunting caimans for skins and meat in the area. — Ronis Da Silveira, *Projeto Mamirauá*, Cx. Postal 38, 69470-000, Tefé-AM, Brazil, fax 0055927432736, e-mail: qgmamira@cnpq.br, Marcelo Gordo (Departamento de Biologia), & Jaydione Marcon (Departamento de Ciências Pesqueiras), Universidade de Amazonas, Manaus - AM, Brazil, and José Raimundo da Silva, Núcleo de Fauna - Superintendência do Amazonas, IBAMA, Manaus - AM, Brazil.

Costa Rica

CROCODILE ATTACKS CAUSE CONSERVATION CRISIS. Since 1995 three people have died as a result of crocodile attacks in Costa Rica. The first was 27 year old Jose Enrique Rojas Mora, a fisherman in Guanacaste province who in his spare time took tourists for rides in his boat. On 4 September 1995, during a trip on the Tempisque River, his boat overturned. His customers, a group of German tourists, pulled themselves to salvation on a small island but Rojas decided to try and swim to the shore to obtain help. This was a dramatic case as the poor man was literally devoured by one of the many crocodiles found in this area. He was taken by the arm and shoulder. The animal was later captured and sacrificed and Rojas' arm was found practically entire, in the animal's stomach.

On 8 April 1997 a similar tragedy occurred in the Mondonguillo National Park on the Atlantic coast. The victim was Ronen Guilat an Israeli of 23 years age visiting the country as a volunteer to assist conservation of the park. He was an excellent swimmer and this was not the first time he swam in the lagoon, even though the local people had advised him of the presence of crocodiles. Two days before he was to depart the country, he was quietly swimming in the lagoon when he was struck by a gigantic crocodile of nearly six meters length, which with a single blow gave him dozens of wounds. In a completely natural behavior, the animal detected a stranger in its territory and for that reason attacked him. The young man was able to swim some meters to the shore, but gravely wounded; he died before he could pass through the swampy edges of the lagoon.

Finally, on 1 May this year, Dennis Chacon, a 25 year old resident of Alajuelita had an unfortunate encounter in the Tivies section near Puntarenas on the Pacific coast. Chacon was an excellent swimmer and when a fisherman entangled his line at the mouth of the Jesus Maria river he offered to swim down and untangle it. Although the presence of crocodiles is well known in this area, Chacon apparently was unaware of the danger. From a reconstruction of events later, it

appears that Dennis swam down following the line to a depth of about 3 m when the water became extremely turbulent. Its possible, although not certain, that the hook was in the mouth of a crocodile. As he pulled strongly on the line he was attacked. As in the case at Matina, the crocodile made a single strike and did not attempt to continue its attack. Following a strategy used by crocodiles when faced with a large opponent, it submerged until its victim did not offer any additional resistance, and following returned to its patrol of the river as if nothing had happened not understanding its extraordinary action, but merely responding instinctively to a stimulus.

As might be expected, these accidents have saddened three families, who for obvious reasons hate all these animals. The problem is that for many Costa Ricans these events generate a climate of insecurity, fear and hatred of crocodiles and groups concerned with ecology and wildlife are very concerned about the adverse consequences of these attack for the crocodiles.

One of the leaders of the movement for the conservation and study of crocodiles is Juan Bolanos Montero, who has been the President of the Costa Rican Association for Investigators of Crocodiles for two years. However, his exhaustive studies of crocodiles were begun a decade ago when no one in the country was working with these animals. Bolanos, along with many other crocodile specialists, are concerned about the possibility that the loss of human life from crocodile attacks, and the certainty of repetitions, is due to the general ignorance of the populace about the behavior of these animals. Bolanos advised that all the coastal zone and nearby beaches, including rivers up to 500 m from the sea is habitat for crocodiles. He estimates that the areas of highest crocodile populations are the Tarcoles, Tivives, Terraba and Tempisque Rivers, all on the Pacific. However, he insists, precautions must be taken in areas where crocodiles occur in low concentration, as even a small crocodile of 2 m can be dangerous. "We understand that, in most cases, crocodiles are not aggressive animals, most are quite timid. But when they reach a large enough size they become the masters of a sector of river and want to defend their territorial rights," explained Bolanos. To

reinforce his argument Bolanos cited the example that it is difficult to enter a corral with a bull or a porch with a fierce dog. "Even a rooster will defend his food and territory but the problem is there is a world of difference between a chicken's peck and crocodile's bite," said the expert.

Bolanos and the Association continue to promote better understanding of crocodiles in Costa Rica and hope that their efforts will enable crocodiles and people to continue to co-exist. – Yuri Lorena Jimenez, *Copyright La Nacion, San Jose, Costa Rica* <http://www.nacion.co.cr/> used with permission.

NORTH AMERICA

Mexico

VALIDATION REQUIRED FOR MEXICAN IMPORTS AND EXPORTS. In view of Mexico's continued receipt of non-validated CITES documentation for wildlife shipments, it will no longer accept CITES permits or reexport certificates that are not validated by the customs service or competent authorities of the country of export. All parties are requested to accept only export permits or reexport certificates that are validated by the Procuraduria Federal de Proteccion al Ambiente (PROFEPA), which is the Mexican agency in charge of law enforcement. – *CITES Notification No. 988, 13 October 1997.*

A *CROCODYLUS ACUTUS* WITH THE APPEARANCE OF A *C. MORELETII*. In 1997 we continued the project started two



The doubtful "*acutus*" (top) with three siblings one year older. Luis Sigler photo.

No	Total Length (mm)	Snout - Vent Length (mm)	Postoccipital Scutes	Nuchal Scutes	Dorsal Scutes	Double Crest	Simple Crest	Lateral Tail Inclusions
701	320	150	4	5	16	17	18	NO
702	270	125	4	6	16	18	20	7 lt. /8 rt.
703	315	148	4	6	16	18	17	NO
704	320	152	4	5	16	18	18	NO
705	312	146	4	6	16	18	18	NO
706	320	148	4	4	15	18	18	NO
707	320	149	4	5	16	18	19	1 lt. / 1 rt.
708	320	152	4	6	16	18	20	NO

Table 1. Length and scalation of the 8 *Crocodylus acutus* captured on 11/28/1997 at Sumidero Canyon Natl. Park, Chiapas. Note: 702 is the "doubtful" crocodile with 7 and 8 lateral tail inclusions.

years before by the Natural History Institute in Sumidero Canyon National Park, in Chiapas State, on *Crocodylus acutus*. In 1997, due to budget reasons, we could not realize the monthly monitoring, but it was of interest to know what happened with the natural incubation of the eggs. We made a field trip on May 28, and in a known nesting area we saw a group of neonates basking on a branch of a tree eight meters from the nest. In this place we found an active nest last year (1996) and from this we collected eggs for successful artificial incubation and we collected also the neonates after hatch to raise them at the zoo. The neonates captured this year (1997) were 8. We know the nest produced more than 30 in 1996 and we supposed that the other hatchlings had already dispersed on the Grijalva river or had been depredated naturally. The hatchlings were estimated at 8 days of age. Once collected, we reviewed the crocodiles and one of them caught my attention, because it was smaller and more yellow than the others, moreover it had a bite like injury at its tail, which made me observe more closely the lateral scalation of the tail. Surprisingly, it was similar to the scalation typical in *Crocodylus moreletii*, meaning with the lateral and ventral inclusions (more than 7 in each side). After that we reviewed the nest and there were no more eggs. The next day we measured the length and weight of each hatchling and annotated the general scalation. See Table 1.

My hypotheses to this respect are:

- This hatchling is a hybrid from a male *Crocodylus moreletii* and a female *C. acutus*. – We never had seen species other than *C. acutus* in the Na-

tional Park and if a male *C. moreletii* was in there we would have seen it before. The female nested in the same place last year and her hatchlings were typical *C. acutus*, in fact some of the 1996 hatchlings are now at the zoo.

- This hatchling was carried by a raptor and released in the collected area. – *Crocodylus moreletii* hatches naturally in the Chiapas State between August and September. In the farm "Crocodiles from Chiapas" located in Tapachula, Chiapas, they have obtained hatchlings in July. Tapachula is more than 240 km. in straight line to the national park and is separated by the Sierra Madre de Chiapas. There are no other *C. moreletii* farms or wild populations near.

- The suspected hatchling belongs to the same nest as the other seven. – It showed an umbilical scar with the same 10 days old characteristics as the other seven hatchlings. It was basking with the others and all of them were at no more than 8 meters from the nest.

- *C. acutus* is a species phylogenetically older than *C. moreletii* and could show "genetics jumps" to *C. moreletii* which proceed from this. – This must be verified with a complete genetic exam.

- *C. acutus* immigrates to Chiapas Central Depression from the Gulf of Mexico and probably has genetic information from *C. moreletii* because in Tabasco both species are sympatric. – It is very possible that migration occurred as we think, but this has not been proved yet. The *C. acutus* population in the Grijalva river drainage in Chiapas has been isolated from the rest of Tabasco State since 1964, when the "Nezahualcoyotl" dam was built.

The eight hatchlings at ZOOMAT will be preserved. Other experienced crocodile workers, including Marco Lazcano, Jose Juan Perez Ramirez and Manuel Muniz, agree the form of this crocodile is ambiguous. Steve Platt, in his study of crocs in Belize considered all animals with lateral tail inclusions to be *moreletii*. Steve will come in December to take blood and skin samples from this animal and from other crocs at Sumidero Canyon National Park. It is very interesting that a population of this species which commonly has coastal distribution, has a strong distribution in intercontinental freshwater bodies.

It will be a pleasure to receive comments about this strange *Crocodylus acutus* and to know if any institution is interested in practicing genetic exams to resolve this enigma. – Luis Sigler, *Instituto de Historia Natural. Zoológico Regional*, Muiguel Alvares del Toro, A. P. 6, Tuxtla Gutiérrez C.P. 29000, Chiapas, Mexico. Telefax: (mex) (961) 2 99 43. E-mail: zoomat@tuxtla.podernet.com.mx

CHIAPAS FLOODS. As you may know, in Chiapas it has rained heavily in the last month. All rivers overflowed and a lot of damage was done. We are no exception at Crocodilos de Chiapas Zoo, where we are raising *C. moreletii* and *C. acutus*. Part of the land was washed out and 50% of the zoo disappeared. It happened so fast that we weren't able to move all the animals. Some of them swam and were rescued, others we do not know. We heard that a few were killed and eaten by local people, because there is no food. Luckily, the most aggressive and dangerous (the jaguars and pumas) were captured and relocated and luckily none of the Morelets crocodiles escaped. However, we lost about 60 other animals.

The *moreletii* and *acutus* enclosure was flooded with more than 2.5 m of water and the animals were very nervous and trying to escape. This was prevented by the circular enclosure design and the 45 degree fence around it. We are having a lot of work rebuilding the zoo and the banana plantations. If you know of any institution that can help us rebuild the facility it will be appreciated. But, como dicen en Chiapas "No deje de preocuparse seguimos trabajando." [As they say in Chiapas "You can't worry when there's work to do."] – Manuel Muñis, *Crocodilos de Chiapas S.A. de C.V.*, Mexico City, Mexico, e-mail: jamuniz@data.net.mx.

U.S.A.

FLORIDA GAME & FRESH WATER FISH COMMISSION. *LEPTOSPIROSIS* - WARNING. Over the last three years approximately 9 people working with alligators in south Florida

have apparently contracted *Leptospirosis*. *Leptospirosis* is a spirochaete parasite, most commonly reported from rodents and contracted through contact with rodent urine, but also reported from cows and other domestic animals and contracted through contact with contaminated water. Eight of the victims were management type folks, one a researcher. Four or five of those victims required hospitalization. All the victims were working with wild alligators. Although, most only had contact with the alligator nests. The symptoms range from slight (inapparent) to severe and may include the following: weakness, headache, myalgia, malaise, chills and fever. Certain strains can be serious. The treatment is with antibiotics, penicillins, or tetracycline. There are a number of information sources on the internet. <<http://omni.ucsb.edu/pro/disease.html#b8>> Conclusion: Be aware of the possibility if you have any of these symptoms and advise your doctor so he can prescribe the correct antibiotic. – Linsey Hord <ampsffs@okeechobee.com> *Fl. Game & Fresh Water Fish Commission, Okeechobee, FL, USA*

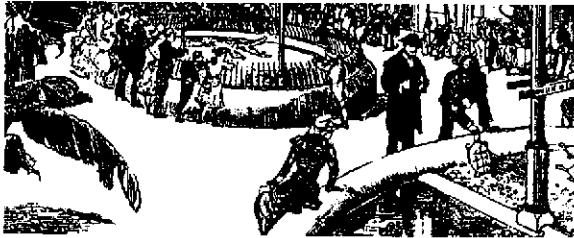
CAIMAN IN PUERTO RICO. Restoration of viable freshwater wetlands in Puerto Rico is obstructed by faunal impoverishment and the dogmatic opposition of some conservationists to the naturalization of exotic species. However, paleobiogeographic evidence of extinct key-stone vertebrates provides an enlightening frame of reference in identifying appropriate species for vacant ecological niches in depauperate island ecosystems.

In the early seventies an awakening public concern with surface and groundwater pollution was decisive in the establishment of the Puerto Rico Department of Natural and Environmental Resources (DNER). An early consultant publicly lamented the absence in local freshwater wetlands of a long-lived top-of-the-food-chain carnivore which might serve to monitor biomagnification of toxic wastes. *Caiman crocodilus* were quietly proliferating in the marshes around lake Tortuguero on the north-central coast of Puerto Rico.

Discovery of the caimans led to an ill-advised and futile policy of eradication in the mid-eighties. A random analysis of caiman viscera in the DNER lab revealed a high concentration of mercury. The finding was suppressed along with the ecological observation that the caimans were feeding mainly on schools of *Tilapia* that had virtually displaced the native fishes. The underlying reasons for a "control" attitude toward the caiman are unclear. Theory holds that insular species and ecosystems are intrinsically fragile and vulnerable to onslaught by alien invasions. Thus, hapless endemics must be protected from adaptively superior exotics. Island equilibrium theory has been challenged

on diverse grounds, including incongruity with historical biogeography. In the caiman case, fossil remains conjoin paleogeographic and regional biogeographic evidence in support of the conclusion that crocodilians are abundant in prehistoric Puerto Rico. — Francisco Watlington, Ph.D. *Department of Geography, University of Puerto Rico.*

ZOOS



VENEZUELA EXPORTS AN ORINOCO CROCODILE BREEDING PAIR (*CROCODYLUS INTERMEDIUS*) TO THE UNITED STATES OF AMERICA. The Dallas World Aquarium built an area to show the beauty and biodiversity of the Venezuelan Orinoco River. It is named ORINOCO, SECRETS OF THE RIVER. Many native Venezuelan flora and fauna species are there on exhibit. We can name howler monkeys, sloth, jaguars, curassows, buff-necked ibises, catfishes, piranhas, anacondas, Orinoco or Arrau turtles and poison frogs among others.

At this aquarium, an exhibit of 150 m² and 64,000 liters of water was designed and built to maintain a breeding pair of Orinoco crocodiles (*Crocodylus intermedius*) for educational, reproductive, and recreational purposes. This is the only pair of this species of crocodile maintained in any North American Zoo or Aquarium and thereby showing the Venezuelan ecological, ecotourist and scientific attractions.

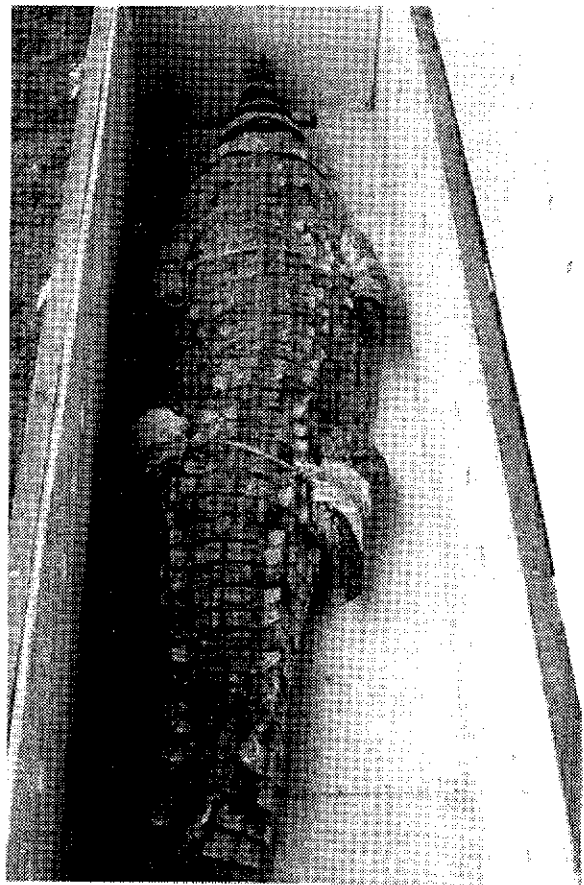
An agreement was signed between the Dallas World Aquarium and PROFAUNA-MARNR (Venezuelan environmental ministry of wild fauna management). The new aquarium made the commitment to make the best effort to reproduce the Orinoco crocodile in their exhibit. The brood should be returned to Venezuela in order to be included in the National Recovery Program of the Orinoco crocodile, which performs captive breeding and release into the wild, as well as monitoring the wild population.

The two crocodiles, a male and a female, each approximately three meters long, were chosen at the "Agropecuaria Puerto Miranda Crocodile Farm" at Guarico state of Venezuela.

On May 11th, 1998, the animals were sent in two wooden boxes especially designed according to specifications of the IATA and the US Fish and Wildlife Service (*see photo*). The animals were transported by truck from the crocodile farm to the Caracas airport of Maiquetia, and then via American Airlines to Dallas.

This valuable cargo traveled all the way in the company and care of the director of the Dallas World Aquarium and the wildlife veterinarian from the Puerto Miranda Crocodile Farm. The trip took the crocodiles and their keepers 60 hours. At the end the animals were very tired, but in good condition.

The next day the crocodiles ate normally, but for security reasons, they were maintained in separate enclosures for a few days. A week later and to this day the animals are kept together, without problems, in a new, wonderful exhibit. — Ernesto O. Boede V.M. *Agropecuaria Puerto Miranda C.A., Apartado postal 1595, Valencia 2001, Venezuela.*



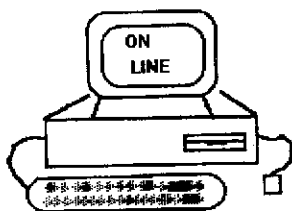
Orinoco crocodile in specially designed box ready to be shipped to the Dallas World Aquarium. E. Boede photo.

ORINOCO CROCS IMPORTED BY DALLAS WORLD AQUARIUM. On May 12th 1998 a pair of adult Orinoco crocodiles, *Crocodylus intermedius*, arrived at the Dallas World Aquarium (DWA) in Dallas, Texas. Imported from the Agropecuaria Crocodile Farm in Puerto Miranda Venezuela and accompanied by their consulting veterinarian Dr. Ernesto O. Boede, the crocodiles are on breeding loan to DWA and remain the property of the Venezuelan government and their regulatory agency PROFAUNA. In exchange DWA, has agreed to a five year commitment to provide funding support for facility maintenance and improvements to the Puerto Miranda farm.

The crocodiles have settled in nicely to their new exhibit and began feeding only a day after arriving. The pair was introduced within a week and appear to be compatible; despite the female's larger size (3 meters) the male has emerged the dominant animal. The female is a proven breeder, and both specimens were raised in private facilities prior to going to Puerto Miranda and are considered non-releasable.

The crocs feature prominently in DWA's new rainforest exhibit, *Orinoco, Secrets of the River*, which opened in 1998. The new crocodile exhibit was officially unveiled to the public and media on June 11, and the event was commemorated with a color poster featuring an Orinoco crocodile in situ. DWA is an accredited member of the American Zoo and Aquarium Association (AZA). – Rick Hudson, *Ft. Worth Zoo, 1989 Colonial, Ft. Worth, TX 76110 USA*.

CSG ON-LINE



The following new croc sites have been reported to us recently:

Cool crocodilian chat site moderated: <<http://www.kingsnake.com/forum/gator//index.html>>

Visit: <http://www.serioussilver.com/alligator.html> for info on alligators & crocodiles, their habits and how to connect with their energy. This page will be permanent at this URL.

This web site has a link to some nice gator/croc sites...just go to site and scan down to alligators: <<http://netvet.wustl.edu/reptiles.htm#gator>> Electronic Zoo / NetVet Veterinary Resources

CSG PAGE WINS MICROSOFT AWARD. I stumbled across the Microsoft Network 'Best of the Web' page this weekend and discovered that our Crocodile Specialist Group page had been awarded a 3-star (out of a possible 4 star) rating. It can be found on page 1 of 'Biology & Botany' under 'Earth & Life Sciences' at: <<http://home.microsoft.com/exploring/subcats/Y8520T3X11Z2.HTM>>. It can also be found on page 2 of 'Wildlife & Nature' under 'Earth & Life Sciences' at: <<http://home.microsoft.com/exploring/subcats/Y8577T3X11Z2.HTM>>. – F. Wayne King, *Deputy Chairman and Newsletter editor CSG*.

PUBLICATIONS



RECENT PUBLICATIONS 1996-1997. Our gratitude goes out, once more, to Ms. K Fleming, editor of Wildlife Reviews, for providing a listing of recent publications covering the publications years 1996-1997.

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PERSONALS

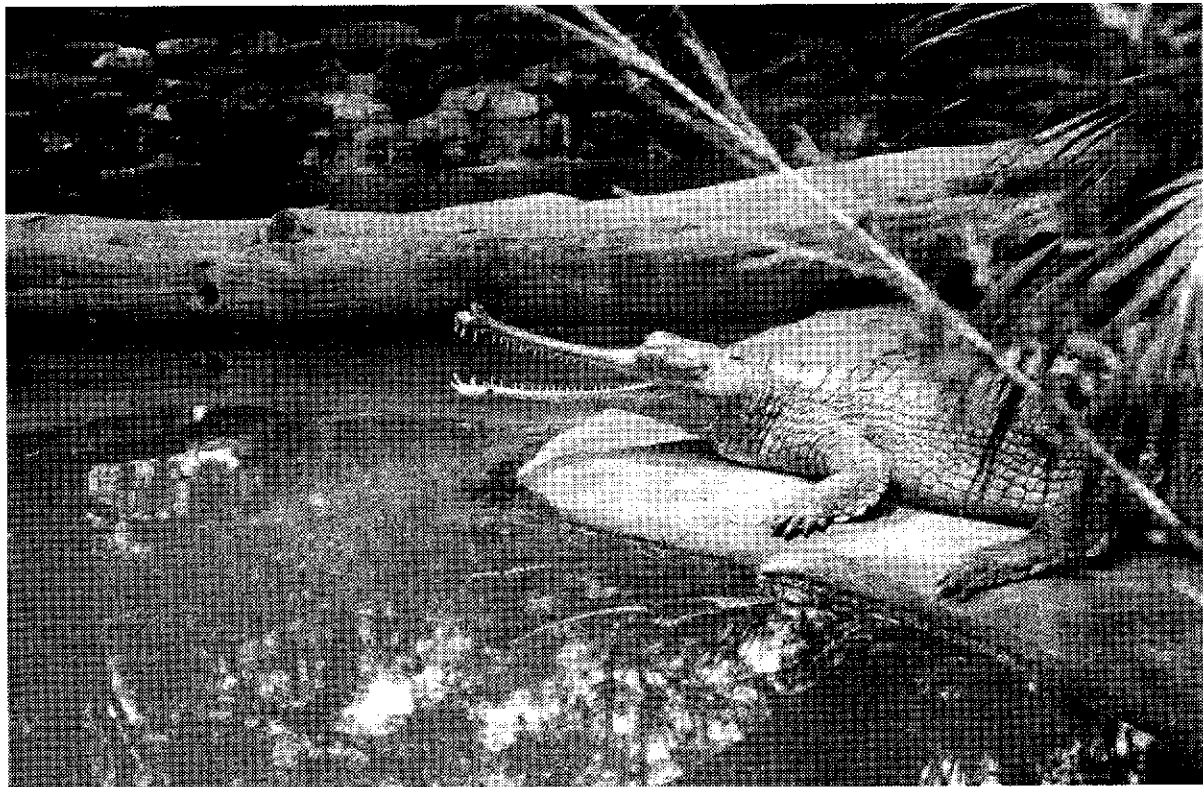
Jon Hutton (note new address) *African Resources Trust World Conservation Monitoring Centre 219 Huntington Road Cambridge CB3 0DL UK*, has moved from Zimbabwe with the family to undertake a two year contract with ART in Europe.



Tomas Walker and wife Carina, *Zavalia 2090 - 3B Buenos Aires, 1628 Argentina*, E-mail: <curiyu@interserver.com.ar>, wrote to tell us that on the 1st of September 1998, Julia Walker, their daughter came successfully to this world!



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Gavialis gangeticus, St. Augustine Alligator Farm May 1998. Ralf Sommerlad photo.

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