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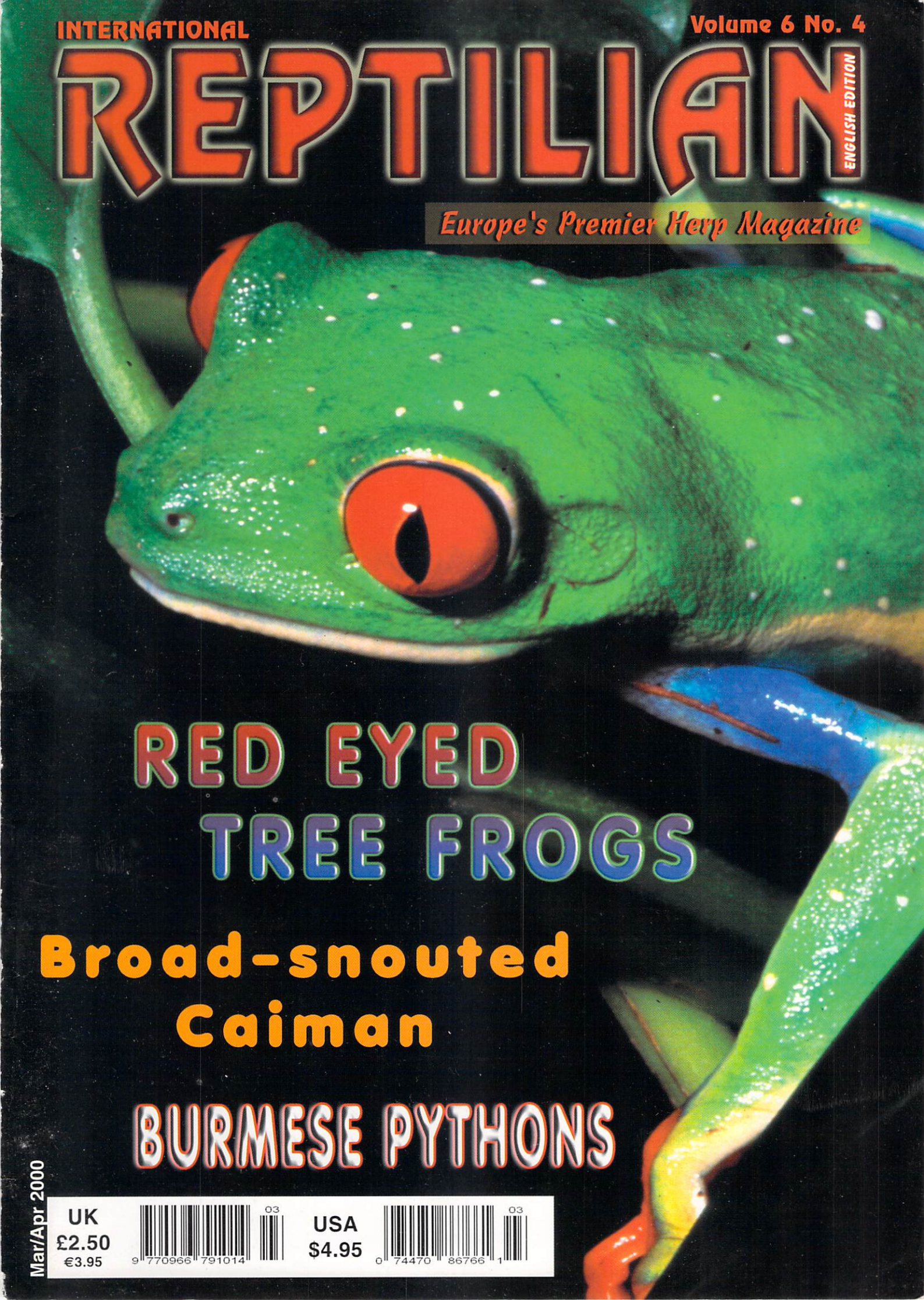

## RED EYED TREE FROGS

## Broad-snouted Caiman

## BURMESE PYTHONS

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# CONSERVING THE BRO

# *Caiman latirostris*

**INTRODUCTION**

In the northern Argentina wetlands, a team of biologists and researchers gather eggs from a nest of the broad-snouted caiman, *Caiman latirostris.* Nearby is the mother, and like all crocodilians, she defends the nest. The team will catch, measure and tag her before releasing her back into the swamps. Once the eggs are collected, they are carefully transported back to the Proyecto Yacare team's headquarters in Santa Fe.

Back in Santa Fe, the eggs will be placed in an incubator where they will remain at about 31.5$^{o}$ and 95% humidity for the incubation period - which in the wild is about 70 - 80 days. Once the young caimans have hatched, they will he reared until large enough to avoid the predators of hatchlings. After this, half of the yearlings will he released at the site from which their eggs were collected. The other half are destined for the skin trade.

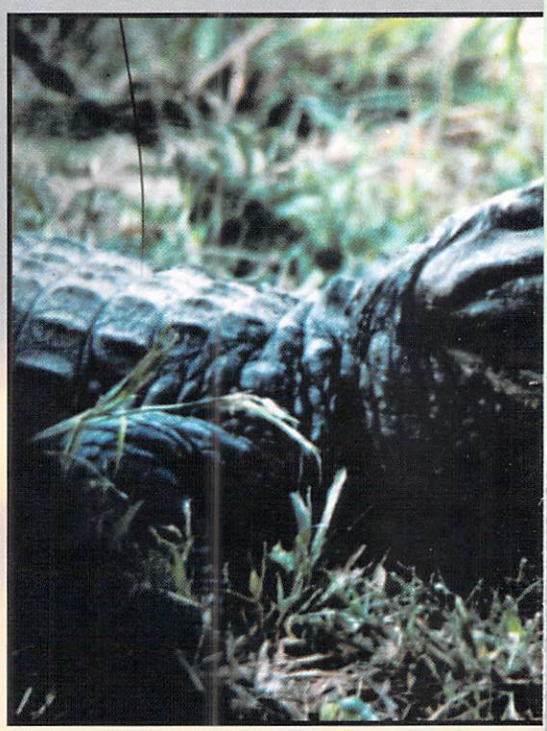
***CAIMAN LATIROSTRIS***

The broad-snouted caiman ranching project in Argentina has been operating since 1990, under the leadership of Alejandro Larriera, the Vice Chairman of the Crocodile Specialist Group for Latin America and the Carribean. The team is now promoting eco-tourism as a way to aid the conservation of caiman and their habitats, and offering those involved a unique experience - taking part in all aspects of the ranch, from egg collecting to releasing the yearlings hack into the wild

The broad-snouted caiman is a medium-sized crocodilian, with a maximum size *of* 3.5 m, though individuals over 2 m are rare today in the wild. As its name implies, it has the broadest snout in relation to its size of any living crocodilian. The local name for the broad-snouted caiman in Argentina is *Vacaré Overo.*

*C. latirostris* is a mound-nesting species, laying up to about 50 eggs in the wet-season. Nesting habitat in Argentina is noted to include forests, floating mats of vegetation in swampy areas and raised ridges around lakes, streams, swamps and artificial ponds or reservoirs. It has been bred a number of times in captivity, which is where much of the data on ecology and reproduction of this species comes from.

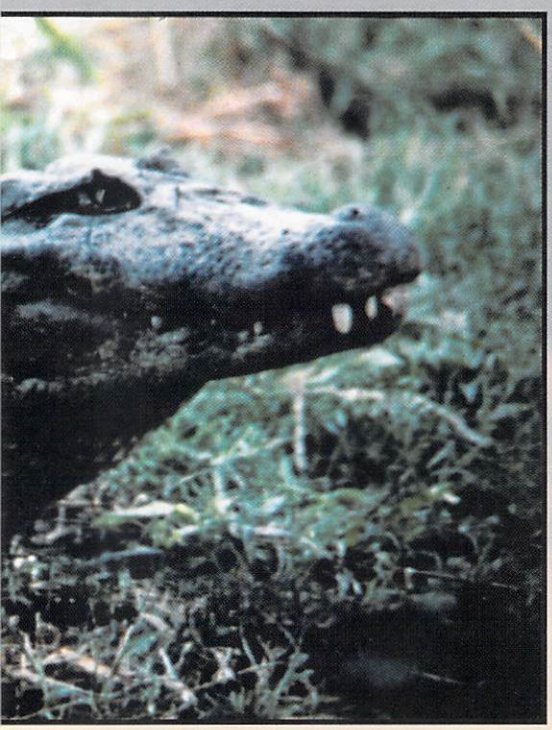
The distribution of the species extends across northeast Argentina, southeast Bolivia, Paraguay, northern Uruguay and the Parana and Sao Francisco River systems in Brazil. Throughout much of this range, *Caiman latirostris* numbers have been depleted. The Bolivian population of broad-snouted caiman is considered close to extinction, whilst large areas of the Parana and Sao Fransisco River systems have been dammed for hydroelectric stations. Other areas have been either drained for agriculture or their rivers polluted. Surveys in Argentina and Paraguay indicate healthy populations in these two countries. Whilst no recent data is available from Uruguay, it appears that *C. latirostris* numbers are in decline in that country, due mainly to habitat destruction.



In 1998, the Argentine population of *C. latirosiris* were transferred from CITES Appendix I to Appendix 2, under the Ranching Resolution. This is a significant move, and means that the wild numbers of this species are sufficient to allow the development of ranching for the purpose of commercially producing hides for the skin trade.

# AD-SNOUTED CAIMAN

## By Colin Stevenson



**CONSERVATION OVERVIEW**

The mere mention of the term 'skin-trade' is enough to make conservationists reel. It is, after all, the enormous trade in crocodilian skins that sent their wild numbers plummeting to the edge of extinction. Many authors writing in the early 1970's were deeply concerned about the fate of crocodilians. The late authority on South American crocodilians, Federico Medem, stated in 1971 that "without exaggeration and undue sensationalism it must be stated that the present situation concerning the South American crocodilians is rather pessimistic."

In the period 1950 – 1965, for Amazonas

Coral snake
*Microrus* sp.

In the swamp with the airboat.

State in Brazil ONLY, around 7.5 million black and spectacled caiman *(Melanosuchus niger* and *Caiman crocodilus sp.* respectively) were exterminated. In Colombia for 1969 - 1970, around 1.4 million were killed. Consider that nearly all 23 species were hunted in each country of occurrence, in some cases for periods of over 40 years, and this gives some idea of the impact hide-hunting had on crocodilian populations.

This level of unregulated hunting saw critical depletions of the once common black caiman, although the spectacled caiman has appeared remarkably resilient (due in part to their reproducing at quite a small size, and the hunting having concentrated on larger males). When you combine this with habitat modifications based on agriculture, development and expanding human populations, the odds were stacked against the crocodilians. In spite of this, crocodilians have proven themselves a success, not only in evolutionary design, but also in conservation and management programs.

In the late 1960's, with all 23 species of crocodilian heading toward extinction, the IUCN (The World Conservation Union) set up the Crocodile Specialist Group (CSG) as a part of their Species Survival Commission. After an initial period of establishing the status of all crocodilians, the CSG set about creating management programs to effectively conserve crocodilians. Largely as a result of CSG efforts and recommendations, the future of crocodilians is a lot brighter. At present, only four are still listed as Critically Endangered by the IUCN, whilst another eight are either Endangered or Vulnerable. The remaining eleven are listed as Lower Risk (see Table I).

Today, the crocodilian skin-trade is a US$500 million per year industry, based mainly on the regulated farming or ranching of either captive-bred or captive-raised crocodilians. From 1987 to 1996, around 2.5 million skins of 'classic' species (i.e. crocodiles and alligators not caiman) were traded world-wide. Legal trade in caiman skins (almost exclusively spectacled caiman *Caiman crocodilus* ) for the same period was almost 6 million skins. Although there are concerns expressed of a still-thriving illegal trade, the extent of this is unknown.

## SUSTAINABLE USE

It is ironic that the skin trade that once threatened the crocodilians is now their saviour.

Crocodiles have a reputation for being large, mean, aggressive predators which will attack anyone and anything that enters their habitat. Of course, readers of this magazine will know better! Large predators they may be, but it is a human trait to saddle an animal with human qualities but crocs. are ruled by instinct and respond to environmental triggers, they don't act out of emotion. Supporters of crocodilians have always been difficult to find. Many people in crocodile country still see them as vermin, and will kill any they come across. Whilst relatively rare, attacks on people do occur and only serve to fuel the ignorant opinions of those that feel that the only good crocodile is a handbag. Obviously, differing attitudes and political climates present their own problems to conservation efforts.

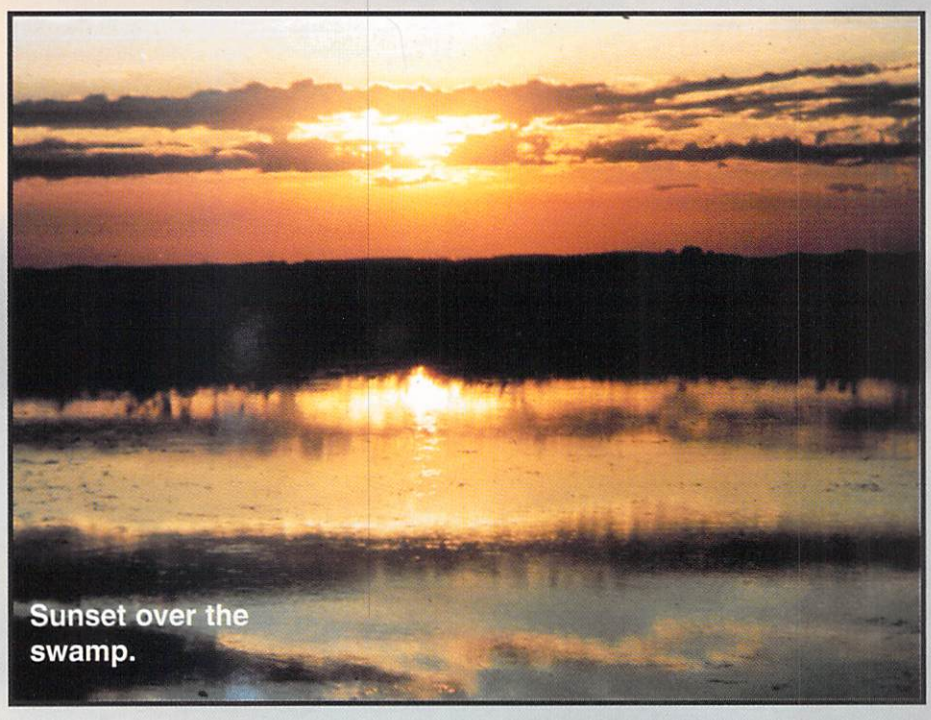
One thing to keep in mind about current programs for conserving crocodilians is that conservation must work at the species level - not the individual level. The key to conserving crocodilian populations is providing a benefit. The idea is quite simple: if crocs. are valuable to the local people and their economy, then there is more incentive to conserve them. If the local people, for example, are paid to collect eggs from wild nests, or paid according to the number of eggs collected from their land, then they will be more inclined to conserve, not only the breeding crocodile population, but their nesting habitats as well.

The numbers collected are determined from surveys and are partly based on estimated natural mortality of wild crocodilians. Some crocodilian populations are estimated at having mortality rates over 90% in the first year, so by utilising the crocodilians that would have naturally succumbed to predation, the demand for the skin-trade can be exploited without detrimental effects on wild numbers. Constant surveys are vital to the programmes and by releasing a small percentage back into the wild (when they are large enough to avoid predators of hatchlings), this population is enhanced. Money from the skin-trade goes into local economies

In successful programs, local people have been educated to the fact that protecting the natural environment can provide them with income indefinitely, whereas poaching crocodilians will offer only short-term gain. By tightening controls within the skin trade, illegal poaching, whilst still occurring, is at least being minimised. Another factor growing in importance is tourism. When visiting Northern Australia or Florida, most people will consider visiting a crocodile or alligator farm, and seeing the animals in the wild, is one of the draw-cards for both destinations.

La Colarada lagoon.

Capybara.



Sunset over the swamp.

Captive-breeding of endangered species, whilst ensuring that total extinction doesn't occur, is useless to wild populations unless there is habitat left to return them to. The situation of the Chinese alligator *Alligator sinensis,* illustrates this point. There are thousands that have been captive bred for re-release into the wild, but due to lack of habitat and support for conservation activities, they remain in captivity. So, as the captive population increases, the wild population decreases.

**PROYECTO YACARÉ**

As mentioned, Proyecto Yacaré commenced in 1990 in Santa Fe province, from agreements between the Instituto Nacional de Tecnologia Agropecuaria (INTA) and the Ministerio de Agricultura, Ganaderia, Industria and Comercio (MAGIC), and later the Mutual del Personal Civil de la Nacion (MUPCN). The project is lead by Alejandro Larriera, Regional Vice Chairman for Latin America and the Caribbean of the Crocodile Specialist Group. It has so far successfully returned over 10,000 yearlings to the wild in northern Argentina, contributing greatly to the knowledge of broad-snouted caiman and captive-rearing of crocodilians in general.

The philosophy of the project is not just about caimans, though, in fact, the aim is for total ecosystem conservation The eventual success of this project will be measured not only in increased numbers of caiman, but in the amount of swamp and wetland habitat preserved. The ranching of caiman is one way of ensuring that the wetlands remain economically important to the owners of these lands. The eco-tourism proposal is another.

Nest on floating vegetation.

Harvesting eggs.

**Methodology**

The methodology of the project is quite simple in principle, and can be outlined as follows;

- Nests are marked by either local inhabitants (usually cattle ranchers who own the land), or by project staff using helicopters within swamp lands

- Eggs are collected from marked nests, and transported hack to Santa Fe for incubation.

- Incubation is carried out in the artificial incubator at 31.5$^{O}$ C with 95% humidity.

- Depending on results from field surveys, the percentages of hatchlings to be commercially raised and those to be released is determined.

- Hatchlings are reared in concrete pools. These nurseries are divided into equal land and water sections. Those destined for release into the wild have basic temperature control (down to about 2O $^{O}$ C' in the colder months), whilst those being reared for commercial purposes never receive a temperature below about 28 $^{O}$ C. The young are fed a diet of minced chicken, bran cereal, and a vitamin/mineral supplement.

- The yearlings to be released are tagged, then released at the site from which the eggs were taken.

- Monitoring is carried out by night-counts in the survey areas. The results are statistically analysed to provide ongoing data for the project.

**RESULTS**

The number of eggs harvested has increased from 372 in 1990/1991 to over 2400 in 1998/1999. The hatching rate has improved from about 63% to over 80%. In 1998, over 1200 yearlings were released into the wild, up from 205 in 1991.

The commercially-raised caimans grow much faster, since the temperature is kept nearer optimum levels than it is for those to be released into the wild. It is expected that those raised for commercial purposes will attain a length of about 1 m in 18 months.

In the first three years of the project, there was a spectacular population recovery. The population has now stabilised and around 60% of the total appears to be made up of farm-released animals. Continuing surveys are showing patterns of migration, and may provide important ecological data on this aspect of caiman natural history. Studies of satellite images show that the current working area is 19% of the available wetland habitat in the Province, allowing for future expansion of the project, and new populations of caiman to be found. The success of this project proves the viability of ranching *Caiman latirostris* for commercial sustainable use programs, and will serve as a blueprint for future projects in other countries (e.g. Brazil and Paraguay) for this species.

***Pro yecto Yacaré Eco-tourism Proposal***

For anyone interested in reptiles, South America remains one of the last frontiers. Vast wilderness areas of swamps, forest and wetlands provide endless habitat for countless species of herpetofauna. The prospect of spending a week traversing this wilderness, viewing the wildlife close-up and actually handling caiman, surveying their nests and eggs, and living on a working crocodilian ranch, where conservation and scientific studies are carried out daily, is one that must surely appeal to anyone reading this magazine. It offers the professional herpetologist, or the serious amateur, the chance to get first-hand practical experience that is not available elsewhere.

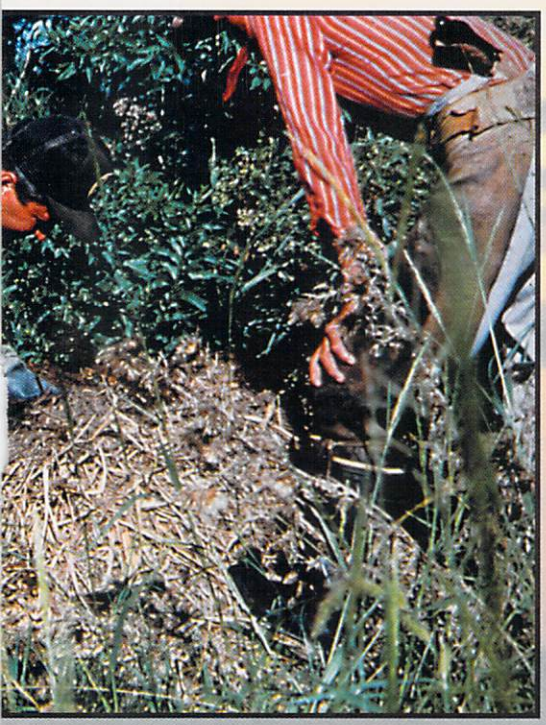
The aim is for this type of tourism to provide another means of funding the project, and so maintaining the economic incentives to conserve the wetlands. As Alejandro Larriera says: "Crocodilian wild habitats are always amazing places, and *C. latirostris* is no exception, besides, our work with horses and our close contact with local inhabitants ('gauchos') would be an unforgettable experience for foreigners."

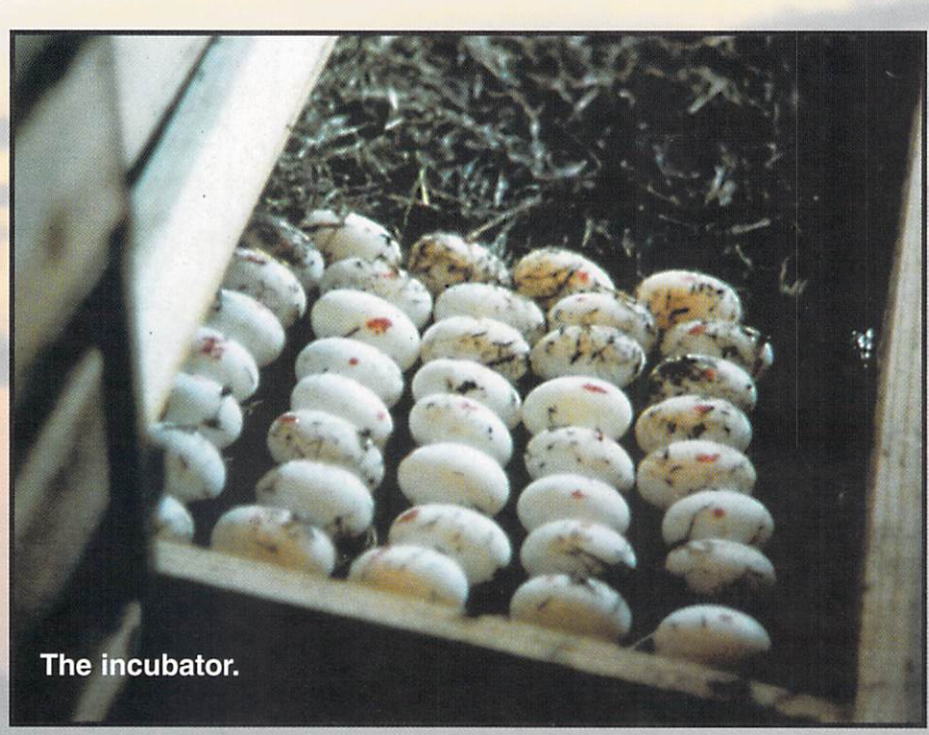
The idea is that the Proyecto Yacaré team will host small groups of no more than four people. Preferably, those taking part must be interested in reptiles, since most activities involve handling caiman. Some of the activities, depending on the season, require good physical fitness.

**Outline of activities**

1. Harvest of eggs - January 10th to February 25th.

There are about 20 places in which the team works. The trip to reach the cattle ranches from Santa Fe takes between three and five hours. Once the team arrives in the field, the cattle ranch





The incubator.

employees ("gauchos") prepare the horses and guide the team into the forest to find the marked nests. The eggs are collected and carried in plastic containers on the horses. The collections take between two and seven hours, depending on the place of collection and the condition of the participants. It is possible for those requiring a break to rest whilst the others continue with the harvesting. This work usually involves the capture of a few adult females when they are found close to the nest. The animals are measured, marked and released.

The team will regularly stay overnight in the large, comfortable country homes of the cattle ranchers. In the morning, more nests are harvested, before returning to Santa Fe after midday and relocating the eggs in the incubator. This is the hardest work and requires a good level of fitness, since temperatures can reach 42°C during the day, with around 80% humidity.

2. Night Counts - From October to April

Night counts occur at the same places as the egg-harvesting. The counts start after 9:00PM and take between two and four hours. Counts are carried out with high-power lights from airboats, canoes or horses. Again, this work usually involves the capture of a few individuals in order to identity if they are wild or released animals. They are measured and marked, and blood samples may be taken.

Again, accommodation is at the cattle ranches. All work is carried out at night, so high temperatures arc not a factor. Note that mosquitoes can be a problem, but strong repellents are used and there is no problem with malaria and other mosquito-borne diseases here.

*C. latirostris* hatchling.

Horse readied for egg harvest.

3. Hatching – Middle of February to middle of March

All hatching work is carried out at the Santa Fe station. Every day, the incubator is checked - there may be up to 3000 eggs. When a nest is identified for hatching (from the calls of the young caiman in the eggs), all the eggs of that nest are moved to the hatching room. After one day there, all hatchlings that have not broken the eggs by themselves are helped by the team, which is what the female caiman would do in the wild.

Once the hatching season starts, there are regularly between 80 and 200 new caiman in the station. Before relocating to the rearing pools, each caiman is measured, weighed and marked. This work is quite easy, and all takes place within the Santa Fe station, which is where visitors will be staying.

4. Routine Measurements - All year

Every month, animals in the rearing pools are captured for measuring and blood samples are taken.

5. Routine Field Trips - From April to October

These trips involve visiting the cattle ranch owners and speaking to their employees to determine new areas to harvest during the next season. Exploring new areas requires horseback riding. The trip is usually about two days and during this time the weather is good - between $10^0$C and $22^0$C. It is also a great time for viewing the general wildlife of the area.

Other activities

It's not all work during a stay. The team have organised several trips to places of interest around Santa Fe, such as:

- A day visit to the old Santa Fe city (Cayastá), about 70 kms north of Santa Fe on the San Javier river. Trip featuring 400 year-old ruins.
- A city tour of Santa Fe.
- A boat trip to the islands close to Santa Fe. Departing Santa Fe city, the boat travels the Paraná river, and can take from half a day to two days, depending on the preference of the visitors. Fishing is allowed on the trip, but hunting is forbidden.
- A fully guided tour of the Experimental Breeding Station in Santa Fe. This is the home of Proyecto Yacaré and is also where visitors will be staying. It contains a zoo with the most representative collection of South American fauna in Argentina (possibly in the world). There are more than 200 species represented, including jaguars, pumas, maned wolves, tapir, swamp deer, pampas deer, wild foxes, otters, capybaras, eagles, flamingos, snakes, lizards and much more.

**GETTING TO SANTA FE**

Santa Fe City is about 450 kms north of Buenos Aires. International flights arrive in Buenos Aires and from there Santa Fe is 40 minutes by plane, or five hours by bus. Planes and buses both depart for Santa Fe every two to four hours, so there is a regular service available.

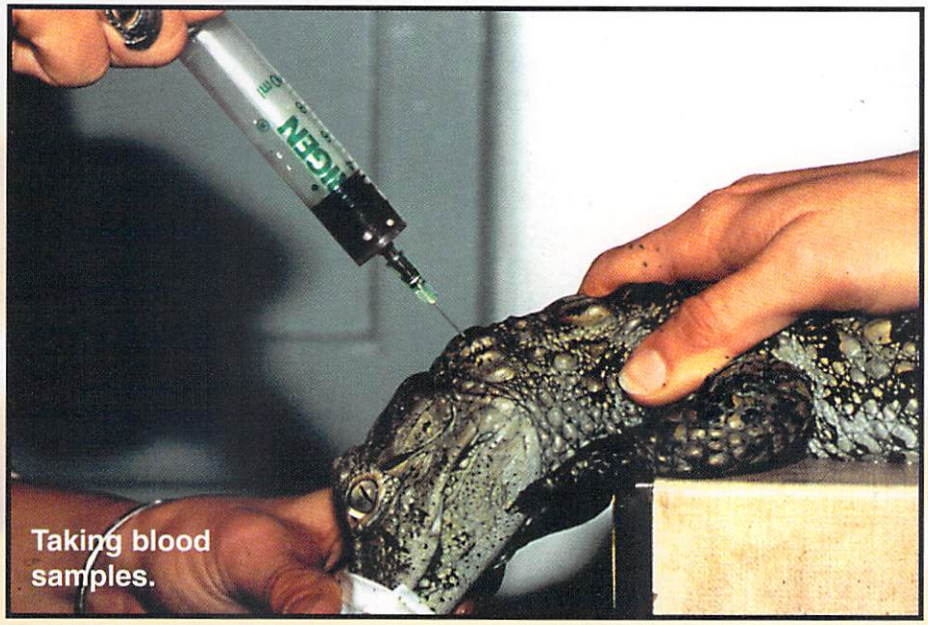
**Cost**

The cost of the eco-tourism trip is US$900 per person (minimum of 2 and maximum of 4 persons).

This includes:
- Eight or nine days accommodation at Santa Fe station. This is a fully equipped house with two bedrooms, air conditioning, bathroom with hot water and a kitchen with a fridge and freezer, stocked with wine, beer and soft drinks (all you can drink is included in the price).
- All field trips, which are in air-conditioned trucks. Lunch and dinner on the field trips is provided (dinners are usually typical Argentine barbecues)
- Meals at Santa Fe restaurants.
- Breakfast provided at the place of accommodation.
- Trips to Cayastá, the City tour, the trip to the islands and the guided visit around the Breeding Station.
- Transport to and from the airport or bus station in Santa Fe.
- A 30 minute video with a summary of visitor activities

All activities are accompanied by members of the Proyecto Yacaré team

Rearing nursery.



Taking blood samples.

Every trip to the field is arranged according to the abilities of the visitor. Before every trip, a training session about air-boating, canoeing, horse riding, egg harvesting and caiman handling (depending on the activity) will be carried out at the Santa Fe station.

**Contacts**

The head of this project, Alejandro Larriera, is the contact fur organising your trip. You can contact Alejandro for bookings and further information at:

**Alejandro Larriera**
Pje. Pvdo. 4455 (Centeno 950)
Santa Fe 3000, Argentina
**email: yacare@arnet.com.ar**

For the Web surfers out there, you can also view the Proyecto Yacaré Website at:
**http://members.xoom.com/PYecotour/Yacare.html**

***Summary***

Crocodilians are survivors. They present a diversity of species that surprises those who have only seen alligators and Nile or saltwater crocodiles on TV. Proyecto Yacaré provides an opportunity to work with caiman that is rarely seen in captivity, utilising the latest methods in crocodilian management, whilst experiencing life in the Argentine wetlands and also directly aiding the conservation of the ecosystem.

For anyone interested in reptiles, crocodilians in particular, this offers an amazing experience. For those who plan to take up herpetology or biology as a profession, it is an essential experience.

| Species | Common Name | Category |
|---|---|---|
| ***Tomistoma schlegelii*** | False gharial | DD (EN?) |
| ***Crocodylus cataphractus*** | Slender-snouted crocodile | DD (EN/V?) |
| ***Crocodylus mindorensis*** | Philippine crocodile | CR |
| ***Crocodylus siamensis*** | Siamese crocdile | CR |
| ***Alligator sinensis*** | Chinese alligator | CR |
| ***Crocodylus intermedius*** | Orinoco crocdile | CR |
| ***Melanosuchus niger*** | Black caiman | EN |
| ***Crocodylus rhombifer*** | Cuban crocodile | EN |
| ***Gavialis gangeticus*** | Gharial | EN |
| ***Crocodylus palustris*** | Mugger | VU |
| ***Osteolaemus tetraspis*** | Dwarf crocodile | VU |
| ***Crocodylus acutus*** | American crocodile | VU |
| ***Crocodylus moreletii*** | Morelet's crocodile | LR |
| ***Alligator mississippiensis*** | American alligator | LR |
| ***Crocodylus niloticus*** | Nile crocodile | LR |
| ***Crocodylus novaeguineae*** | New Guinea crocodile | LR |
| ***Crocodylus porosus*** | Saltwater crocodile | LR |
| ***Crocodylus johnsoni*** | Australian freshwater crocodile | LR |
| ***Caiman crocodilus*** | Spectacled caiman | LR |
| ***Caiman yacare*** | Yacaré | LR |
| ***Caiman latirostris*** | Broad-snouted caiman | LR |
| ***Paleosuchus trigonatus*** | Smooth-fronted caiman | LR |
| ***Paleosuchus palpebrosus*** | Dwarf caiman | LR |

CR=Critically Endangered
EN=Endangered
VU=Vulnerable
LR=Low Risk
DD=Data Deficient (ie. more studies are required to determine status)

Table 1. IUCN Red List Caregories 1996.

Sources:

Crocodiles: Procedings of the Working Meetings of the Crocodile Specialist Group, Vol.1 - 14 (1971 - 1998). IUCN, Gland, Switzerland.

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